GRUNDIG SERVICE MANUAL

CAM CORDER

Service Manual

Ⓓ Btx ∗ 32700 #

VS 8000

O' MECHANISM

VIDE-V16524

VS 8000 (75987-525.00)

Service Manual		Service Manual	Service Manual
VS 8000 72010-507.55	+	Video 8 / O MECHANISM 72010-508.00	NA 8 72010-507.65

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM System
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Playback time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Fast forward time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8x power zoom lens f=8.5 - 68 mm, F 1.4 with macro Filter diameter: 46 mm
Auto focus system	Infrared autofocus
Colour temperature	Auto: From the light at a tungsten lamp to the light on a slightly overcast day. Preset value ☀ (5,800K) ☼ (3,200K)
Minimum illumination	3 lux
Illuminatio range	3 lux – 100,000 lux (0.3 – 9,294 footcandles
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

Input and output connector

Video output	Phono jack, 1V_{p-p}, 75 ohms unbalanced sync negative
Audio output	Phono jack, -7.5 dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo minijack
MIC jack	Minijack, -66 dBs, low impedance with 2.3 – 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY, ■ , ☀ / ☼ ,
▨ , ZERO MEM,
FADER, SP/LP
Caution: ▭ , 💧 , ∞ , ⏏
⊗
Time/Date indication
Title colour and mode indication
Shutter speed indication
Tape counter
Recording/Battery lamp

General

Power requirements	6.0 V (using battery pack) / 7.5 V (using AC power adaptor) 9.0 V (using alkaline batteries) DC
Power consumption	6.5 W (camera recording) including the viewfinder
Installation	Vertically
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to +60°C (-4°F to 140°F)
Dimensions	Approx. 114 x 131 x 315 mm (w/h/d) (4 $^1/_2$ x 5 $^1/_4$ x 12 $^1/_2$ in.)
Weight	Approx. 1.2 kg (2lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni–directional monaurale type

Änderungen vorbehalten
Subject to alteration

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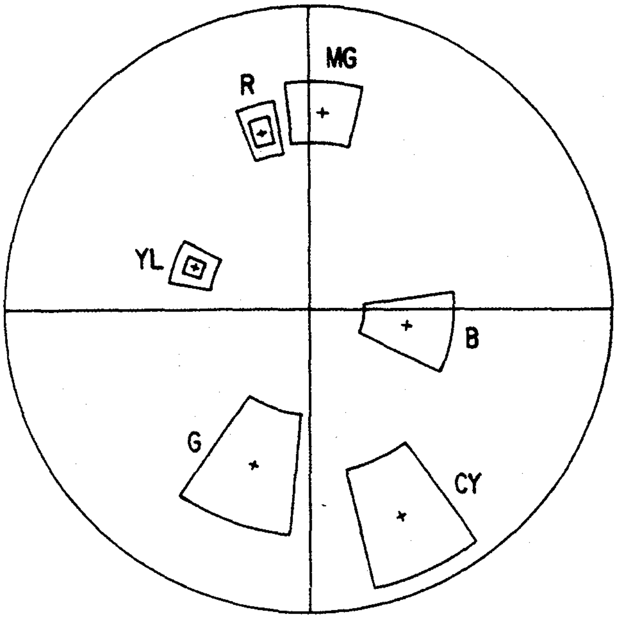
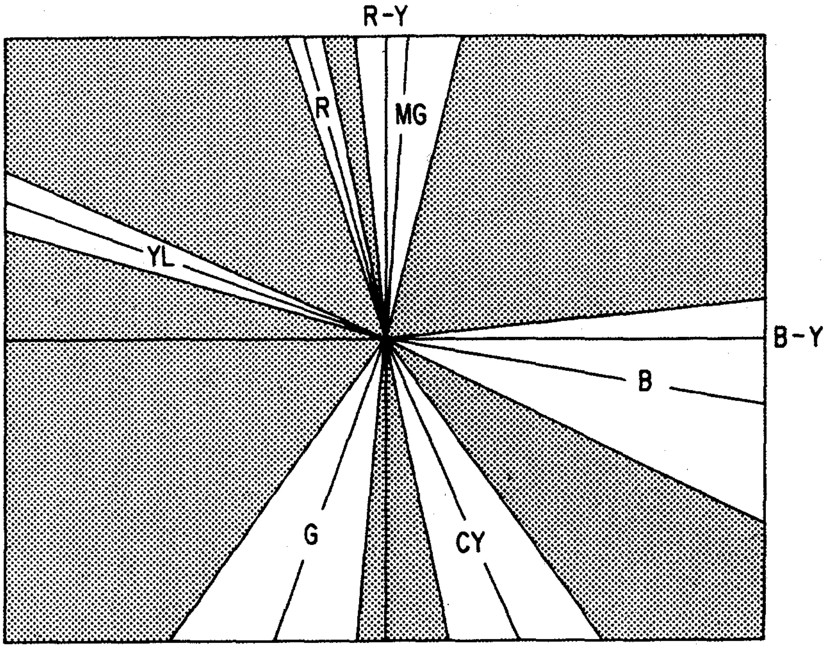


Für Vektorskop / For Vectorscope


R-Y
R
MG
YL
B-Y
B
G
CY

Für Oszilloskop / For Oscilloscope

VS 8000

ALLGEMEINER TEIL D

Sicherheitsvorschriften

⚠ **Achtung:** Bei Eingriffen ins Gerät sind die Sicherheitsvorschriften nach VDE 701 (reparaturbezogen) bzw. VDE 0860 / IEC 65 (gerätebezogen) zu beachten!

Bauteile nach IEC- bzw. VDE-Richtlinien ! Im Ersatzfall nur Teile mit gleicher Spezifikation verwenden!

MOS Vorschriften beim Umgang mit MOS- Bauteilen beachten.

Behandlung von Bauelementen in MOS-Technik

Schaltungen in **MOS**-Technik bedürfen einer besonderen Vorsicht gegenüber statischer Aufladung.
Statische Aufladungen können an allen hochisolierenden Kunststoffen auftreten und auf den Menschen übertragen werden, wenn Kleidung und Schuhe aus synthetischem Material bestehen.

Schutzstrukturen an den Ein- und Ausgängen der MOS-Schaltungen geben wegen ihrer Ansprechzeit nur begrenzte Sicherheit.

Bitte beachten Sie folgende Regeln, um Bauelemente vor Beschädigung durch statische Aufladungen zu schützen:

1. **MOS**-Schaltungen sollen bis zur Verarbeitung in elektrisch leitenden Verpackungen verbleiben. Keinesfalls **MOS**-Bauteile in Styropor oder Plastikschienen lagern oder transportieren.
2. Personen müssen sich durch Berühren eines geerdeten Gegenstandes entladen, bevor sie **MOS**-Bauteile anfassen.
3. **MOS**-Bauelemente dürfen nur am Gehäuse angefaßt werden, ohne die Anschlüsse zu berühren.
4. Prüfung und Bearbeitung darf nur an geerdeten Geräten vorgenommen werden.
5. Lösen oder kontaktieren Sie **MOS**-ICs in Steckfassung nicht unter Betriebsspannung.
6. Bei p-Kanal- **MOS**-Bauelementen dürfen keine positiven Spannungen (bezogen auf den Substratanschluß V_{SS}) an die Schaltung gelangen

Lötvorschriften für MOS-Schaltungen:

- Nur netzgetrennte Niedervoltlötkolben verwenden.
- Maximale Lötzeit 5 Sekunden bei einer Kolbentemperatur von 300 bis 400° C.

Sicherheitsausgangsprüfung

Nachdem Sie die Reparatur beendet haben, überprüfen Sie folgende Punkte, bevor Sie das Gerät an den Kunden zurückgeben:

1. Überprüfen Sie den Bereich Ihrer Reparatur auf fehlende oder schlechte Lötstellen. Kontrollieren Sie die ganze Platinenoberfläche auf Zinnspritzer und Kurzschlüsse.
2. Überprüfen Sie die Platinenverbindungen, und stellen Sie sicher, daß keine Leitungen eingequetscht werden oder Hochlast-Widerständeberühren.
3. Achten Sie auf unerlaubte Ersatzteile, insbesondere Transistoren, die bei früheren Reparaturen eingebaut wurden. Weisen Sie den Kunden darauf hin, und empfehlen Sie den Austausch.
4. Achten Sie auf Teile, die zwar noch funktionieren, aber offensichtliche Abnutzungserscheinungen zeigen. Weisen Sie den Kunden darauf hin, und empfehlen Sie den Austausch.
5. Kontrollieren Sie die Spanung B+ auf den vorgeschrieben Wert.

GENERAL SECTION GB

Safety requirements

⚠ **Attention:** Please observe the applicable safety requirements according to VDE 701 (concerning repairs) and VDE 0860 / IEC 65 (concerning type of product)!

Components to IEC or VDE guidelines! Only use components with the same specifications for replacement!

MOS Observe MOS components handling instructions when servicing!

Handling of MOS Chip Components

MOS circuits require special attention with regard to static charges.

Static charges may occur with any highly insulating plastics and can be transferred to persons wearing clothes and shoes made of synthetic materials.

Protective circuits on the inputs and outputs of **MOS** circuits give protection to a limited extent only due to the time of reaction.

Please observe the following instructions to protect the components against damages from static charges:

1. Keep **MOS** components in conductive packages until they are used. **MOS** components must never be stored or transported in Styropor materials or plastic magazines.
2. Persons have to rid themselves of electrostatic charges by touching a grounded object before handling MOS components.
3. Take the chip by the body without touching the terminals.
4. Use only grounded instruments for testing and processing purposes.
5. Remove or connect **MOS** ICs with in mounting sockets only if the operating voltage is disconnected.
6. The circuits of p-channel **MOS** components must not be connected to positive voltages (with reference to bulk V_{SS}).

MOS Soldering Instructions:

- Use only mains isolated low-voltage soldering irons.
- Maximum soldering period 5 seconds at a soldering iron temperature of 300 to 400 degrees Celsius.

Safety Check-out

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particulary transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

CHIP Technik

Das Gerät ist vorwiegend in Chip Technologie aufgebaut. Nachfolgend beschreiben wir Ihnen den Umgang mit CHIP Bauteilen beim Service.

AUS- UND EINBAUEN VON CHIP-BAUTEILEN

- Verwenden Sie nur einen Niedervoltlötkolben mit Temperaturregelung.
- Die Löttemperatur sollte ca. 240°C betragen, max. 300°C.
- Die Lötzeit halten Sie bitte so kurz wie möglich.
- Belassen Sie CHIP- Bauteile bis zur Bearbeitung in der Originalverpackung. Damit wird die Oxidation der Stirnkontakte vermieden.
- Berühren Sie CHIP- Bauteile nicht mit der bloßen Hand.

AUSLÖTEN VON CHIPS

1. Schritt: CHIP- Lötstelle mit Sauglitze absaugen. (Bild CH1)

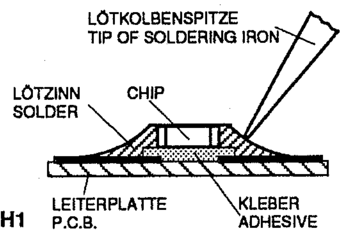


Bild CH1

2. Schritt: CHIP- Enden, bzw. das komplette CHIP-Bauteil erwärmen. CHIP von der Klebung ohne Kraftaufwand abdrehen, damit unter dem CHIP liegende Leiterbahnen nicht abgerissen werden. (Bild CH2)

ACHTUNG! Ausgelötetes CHIP nicht wiederverwenden! Die leitende Schicht kann ausgebrochen sein.

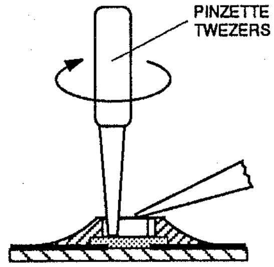


Bild CH2

EINLÖTEN VON CHIPS

3. Schritt: Lötpunkt von Lötrückständen säubern. Lötperle anbringen. (Bild CH3)

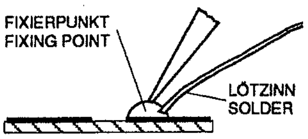


Bild CH3

4. Schritt: CHIP an der Lötstelle ansetzen, zentrieren und anlöten. CHIP nur am Konaktende mit der Pinzette anfassen. (Bild CH4)

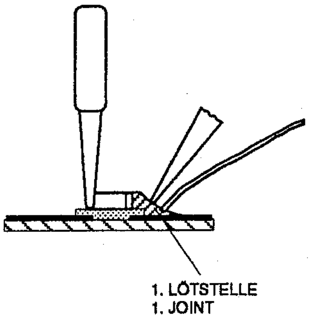


Bild CH4

5.Schritt: Freie Seite löten, und nach dem Erkalten die erste Lötstelle nochmals nachlöten. (Bild CH5)

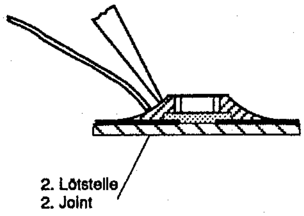


Bild CH5

CHIP Technology

The set has been fabricated utilizing primarily the chip technologies. Please, follow the instructions below when carrying out repair works.

SOLDERING AND UNSOLDERING OF CHIP COMPONENTS

- Use only low-voltage soldering irons with temperature control.
- Permissible soldering temperatures are approx. 240°C up to max. 300°C.
- Keep the soldering period as short as possible.
- Keep the CHIP components in their original packages until they are used to avoid oxidation of the end contacts.
- Do not touch CHIP components with bare hands.

UNSOLDERING OF CHIPS

1st step: Clean the CHIP soldering point with a solder wick. (Fig. CH1)

Fig. CH1

2nd step: Warm up the ends of the CHIP or the whole CHIP component and remove the CHIP from the adhesive by turning it without application of force so that the tracks beneath the CHIP do not break. (Fig. CH2)

ATTENTION! Do not use unsoldered CHIPS any more because the conductive layer may be broken.

Fig. CH2

SOLDERING OF CHIPS

3rd step: Remove possible residues from the soldering point. Then apply a solder bead. (Fig. CH3)

Fig. CH3

4th step: Put the CHIP onto the soldering point, then center and fix it.Use tweezers to hold the CHIP only at the end of the contact. (Fig. CH4)

Fig. CH4

5th step: Solder the free end of the CHIP and resolder the first soldering point after it has cooled. (Fig. CH5)

Fig. CH5

SERVICEMITTEL FÜR CAMERARECORDER / VIDEO REPORTER DER 8MM-FAMILIE TEIL 1 (4/90)
SERVICE JIGS AND TOOLS FOR CAMERA RECORDER / VIDEO REPORTER OF 8MM-FAMILY PART 1 (4/90)

Bezeichnung/Description	Sach-Nr./Order No.	Sony-Nr./No.	VS 8000 O-Mech.	VS 8300 FL-Mech.	VS 8500 U-Mech.	VS 4–8 U-Mech.
GRUNDIG-Testbildsatz/ GRUNDIG-Set of Test Charts	75987-358.56	——	x	x	x	—
Testband WR 5-1 C PAL (30 min SP-Mode, Tracking-Prfg.) /Alignment Tape WR 5-1 (Tracking Check)	75987-526.55	8-967-995-06	x	x	x	x
Testband WR 5-6 C (30 min LP-Mode, Über-Alles-Frequenzgang-Prfg./ Alignment Tape (Frequency Response)	75987-526.56	8-967-995-17	x	x	x	x
Testband WR 5-5 CSP (15 min SP-Mode, MS-,CB-,AFM-,PCM-Prfg.)/ Alignment Tape (MS, CB, AFM, PCM Check	75987-526.57	8-967-995-47	x	x	x	x
Testband WR 5-4 CL (15 min SP-Mode, MS-, CB-, AFM-Prfg.)/ Alignment Tape WR 5-4 CL (MS, CB, AFM Check)	75987-526.58	8-967-995-56	x	x	x	x
Justagefilter für Bandende/Tape end detection filter	75987-536.61	J-6080-848-A	x	—	—	—
Kontaktor (Dial tension gauge)	75987-526.60	J-6080-827-A	x	x	x	x
Bandzugmeßhilfe (Tension measurement gauge / ø 30 tape)	75987-526.61	J-6080-831-A	x	x	x	x
Bandzugmeßhilfe (Tension measurement gauge / ø 16 string)	75987-536.56	J-6080-832-A	x	—	—	—
Bandzugmeßcassette (FWD, RVS winding torque cassette)	75987-526.62	J-6080-824-A	x	x	x	x
Bandlaufeinstell-Schraubendreher (Tape path screwdriver)	75987-526.63	J-6080-811-A	x	—	—	—
Bedienplatte II (Mode selector II panel)	75987-526.64	J-6080-844-A	x	—	—	—
Bedienplatte III (Mode selector III panel)	75987-536.57	J-6082-023-A	—	x	x	x
Betriebsarten-Schalter (Mode selector)	75987-526.65	J-6080-825-A	x	x	x	x
Adapter für Bedienplatte II (Mode selector II conversion connector)	75987-526.66	J-6080-845-A	x	—	—	—
Adapter für Bedienplatte III (Mode selector III conversion connector)	75987-536.58	J-6082-021-A	—	x	x	x
Tracking-Phase-Einstelladapter (Track shift jig)	75987-526.67	J-6080-891-A	x	—	—	—
Verlängerungskabel "U" (Extension cable U)	75987-526.68	J-6080-901-A	x	—	—	—
CTL-Verbindungskabel (CTL connection cord)	75987-526.69	J-6080-891-1	x	—	—	—
Verlängerung SW/SWP (RF/SWP connection cord)	75987-526.70	J-6080-891-2	x	—	—	—
ÖL (Oil) Mitsubishi Diamond Oil Hydrofluid NT-68	75987-526.71	7-661-018-18	x	x	x	x
Halter für Leuchtstoff-Röhren (Flourescent tube holder jig)	75987-527.97	J-6082-022	—	—	—	x
Einstellhilfe für "COMMON"-Spannung (COMMON voltage adjusting jig)	75987-527.98	J-6082-024-A	—	—	—	x
Sechskantstiftschlüssel / Hex. wrench screw driver 0.89mm	75987-536.59	7-700-766-01	—	x	x	x
Schraubendreher für Bandlaufeinstellung / Screw driver for tape path	75987-536.60	J-6082-026-A	—	x	—	—

SERVICEMITTEL FÜR CAMERARECORDER / VIDEO REPORTER DER 8MM-FAMILIE TEIL 2 (4/90)
SERVICE JIGS AND TOOLS FOR CAMERA RECORDER / VIDEO REPORTER OF 8MM-FAMILY PART 2 (4/90)

Bezeichnung/Description	Sach-Nr./Part No.	Sony-Nr./No.	VS 8000 O-Mech.	VS 8300 FL-Mech.	VS 8500 U-Mech.	VS 4–8 U-Mech.
Filter (C14) Ref.No.: J-1	75987-532.01	J-6080-054-A	—	x *1)	x *1)	—
Filter (C22)	75987-536.42	J-6080-829-A	x	—	—	—
Filter (für gutes Wetter / For fine weather)	75987-536.43	J-6080-058-A	x	—	—	—
ND-Filter (0.4) Ref. No.: J2	75987-532.02	J-6080-806-A	x	x *1)	x *1)	—
ND Filter (0.1) Ref. No.: J2	75987-532.03	J-6080-807-A	x	x *1)	x *1)	—
ND Filter (1.0) Ref. No.: J2	75987-532.04	J-6080-808-A	2 x	x *1)	x *1)	—
ND Filter (0.3) Ref. No.: J2	75987-536.44	J-6080-818-A	—	x *1)	—	—
Lichtbox (Pattern box PTB-500)	—	J-6029-140-A	—	x *1)	x *1)	—
Farbtestbild für Lichtbox (Colour Chart for pattern box)	—	J-6020-250-A	—	x *1)	x *1)	—
Verlängerungskabel/Extension Cable K (2P)	75987-536.45	J-6080-873-A	x	—	—	—
Verlängerungskabel/Extension Cable (3P)	75987-536.46	J-6080-041-A	x	—	—	—
Verlängerungskabel/Extension Cable (4P)	75987-536.47	J-6080-042-A	x	—	—	—
Verlängerungskabel/Extension Cable (4P, 1,5mm)	75987-532.05	J-6082-069-A	—	—	x	—
Verlängerungskabel/Extension Cable (5P)	75987-536.48	J-6080-043-A	x	—	—	—
Verlängerungskabel/Extension Cable (5P, 1,25mm)	75987-532.09	J-6082-034-A	—	—	x	—
Verlängerungskabel/Extension Cable (6P, 1mm)	75987-532.10	J-6082-033-A	—	—	x	—
Verlängerungskabel/Extension Cable (6P, 1mm)	75987-532.11	J-6082-018-A	—	—	x	—
Verlängerungskabel/Extension Cable (6P, 1,5mm)	75987-532.06	J-6082-036-A	—	—	x	—
Verlängerungskabel/Extension Cable (7P)	75987-536.49	J-6080-917-A	x	—	—	—
Verlängerungskabel/Extension Cable (7P)	75987-536.50	J-6080-886-A	x	—	—	—
Verlängerungskabel/Extension Cable (8P, 1,25mm)	75987-532.08	J-6082-032-A	—	—	x	—
Verlängerungskabel/Extension Cable (10P, 1mm)	75987-536.51	J-6082-064-A	—	x	—	—
Verlängerungskabel/Extension Cable (11P, 1mm)	75987-532.12	J-6082-013-A	—	—	x	—
Verlängerungskabel/Extension Cable (14P, 1mm)	75987-536.52	J-6082-061-A	—	x	—	—
Verlängerungsflachkabel/Flat Extension Cable (15P)	75987-536.53	J-6082-019-A	x	—	—	—
Verlängerungskabel/Extension Cable (16P, 1mm)	75987-536.54	J-6082-062-A	—	x	—	—
Verlängerungskabel/Extension Cable (18P, 1mm)	75987-532.13	J-6082-030-A	—	—	x	—
Verlängerungskabel/Extension Cable (20P, 1mm)	75987-536.55	J-6082-063-A	—	x	—	—
Verlängerungskabel/Extension Cable (20P, 1mm)	75987-532.07	J-6082-031-A	—	—	x	—
Camerahalter/Camera Holder	75987-532.14	J-6080-894-A	—	—	x	—
Bedieneinheit für Einstellarbeiten/Adjustment Remote Control	75987-532.15	J-6082-053-A	—	x	x	—
Autofokus-µC Datenleser/AF Data Reader	75987-532.16	J-6082-025-A	—	x	x	—

x *1) Diese Serviceteile sind nur im Zusammenhang mit einer Lichtbox sinnvoll. Der "Weißabgleich" und der "Autofokusabgleich" dürfen nur mit einer Lichtbox durchgeführt werden.
NL Nürnberg ist mit einer Lichtbox ausgestattet. Servicestellen, die selbst abgleichen wollen, benötigen eine **Lichtbox** und das dazugehörige **Farbtestbild** (ca. 4.000 - 7.000 DM).
Alle NLs und VGs, die nicht selbst abgleichen, schicken VS 8300 / VS 8500 zum "Weißabgleich und Autofokus-Abgleich" an die NL Nürnberg.

These service parts are only useful in combination with a pattern box. "White balance adjustment and Focus adjustment" are allowed to be carried out only by means of a pattern box.
Our Nuremberg branch is equipped with a pattern box. Service Organizations which want to do these alignments themselves need a pattern box and the appropriate colour chart (approx. 4,000 - 7,000 DM).
All other branches and sales companies which do not want to do these alignments themselves are requested to send VS 8300 / VS 8500 models for "White balance adjustment and Focus adjustment" to the Nuremberg branch.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Dangerously high voltages are present inside the unit. Do not open the cabinet. Refer servicing to qualified personnel only.

Please refer to the illustration corresponding to the letter code indicated in the instructions.

The VS 8000 is a compact video camera recorder combined with a tape recorder. You can record pictures you want and play them back on your television set or colour monitor.

Make sure your supplements
The following units are packed with the VS 8000 video camera recorder.

- Battery pack BP 8-1 (1)
- Lithium battery (1)
- AC power adaptor NA 8 (1)
- Cassette (1)
- RFU adaptor M 8 (1)
- Aerial selector (1)
- Screw driver (1)
- Shoulder strap (1)

For details on these units, please read their instruction manuals.

How to Use This Manual

How the manual is Organized
This manual consists of following four sections:

- Power Sources and Cassette Care
- Camera Operation
- VTR Operation
- General (Hints for Better Shooting, Specification, Troubleshooting etc.)

If it is the first time for you to use a video camera recorder, you should read Power Sources (page 9), Easy Camera Recording with Automatic Adjustment (page 17) and Playback (page 52).

If you are used to a video camera recorder, you should read Hints for Better Shooting at the end of the volume.

Notes

- Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

About Cassette Format

This unit uses 8 mm video format cassettes. It records in the SP mode (approximately 20.051 mm/second) and the LP mode (approximately 10.058 mm/second) and can play back in the SP mode and LP mode. The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

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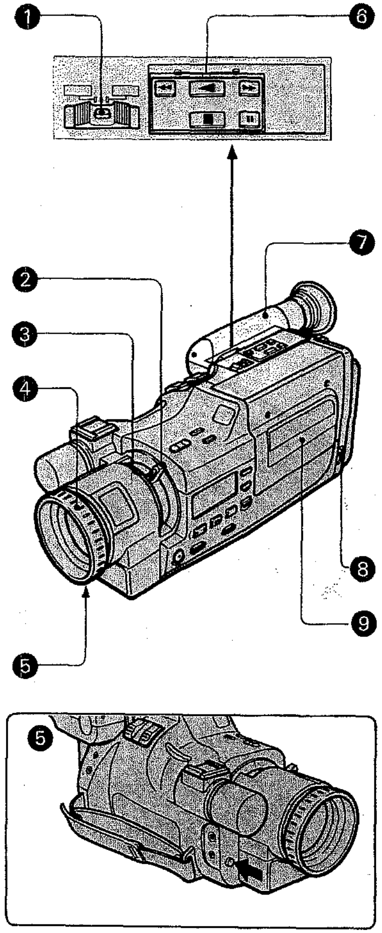
A-1



Identifying the Basic Parts

For details on the use of each control, refer to the pages indicated in the parenthesis.

A-1

❶ **POWER switch**
CAMERA: For camera recording
VIDEO: For playing back or editing tapes
OFF: Power off

❷ **Zoom lever** (page 32)

❸ **Macro set button** (page 34)

❹ **Focus ring** (page 24)

❺ **Start/stop button**
Used for low position recording.

❻ **Tape transport buttons**
◀ (playback)
◀◀ FF (fast forward)
▶▶ REW (rewind)
■ (stop)
❚❚ (pause)

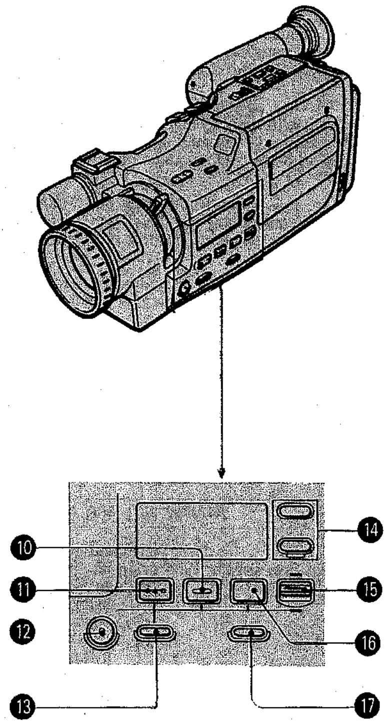
❼ **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

❽ **BATT (battery eject) knob** (page 11)

❾ **Cassette holder**

Identifying the Basic Parts

A-2



A-2

⑩ **WHITE BALANCE** (white balance) **button** (page 28)

⑪ **FOCUS button**
Used for manual focusing.

⑫ **BLC** (back light) **button** (page 29)

⑬ **AUTO FOCUS button** (page 26)

⑭ **DATE and TIME buttons**
Press to display or turn off the date or time.

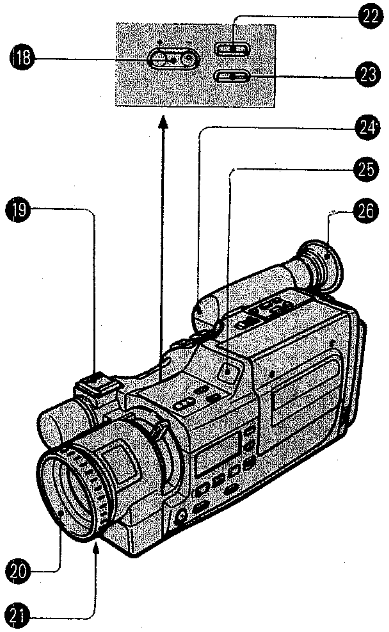
⑮ **AUTO LOCK switch**
Normally set to the upper AUTO LOCK position (green position).

⑯ **SHUTTER** (shutter speed) **button** (page 30)
Used to select the shutter speed.

⑰ **FADER button** (page 35)

Identifying the Basic Parts

A-3



A-3

⑱ **EDIT SEARCH button**

⑲ **Accessory shoe**
Attach an optional external microphone, video light, etc.

⑳ **Lens hood**

㉑ **Infrared beam emitter and detector**
Transmits an infrared beam toward the object to be shot and it is received here during auto focusing. Do not look into for a long time when recording with auto focusing. Do not cover here.

㉒ **RESET** (counter reset) **button**
Press to reset the counter to zero.

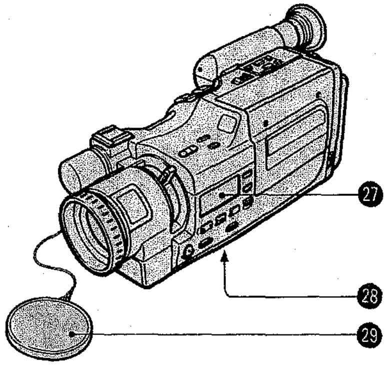
㉓ **DISPLAY MEMORY button**
Used to memorize the counter zero point.

㉔ **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

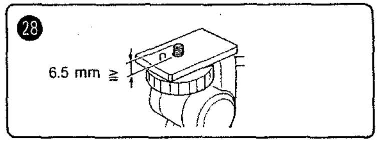
㉕ **White balance sensor**
This is the sensor for auto white balance adjustment.
During recording, do not cover the sensor.

㉖ **Eyecup**

A-4



A-5



Identifying the Basic Parts

A-4

㉗ **Display window** (page 20)

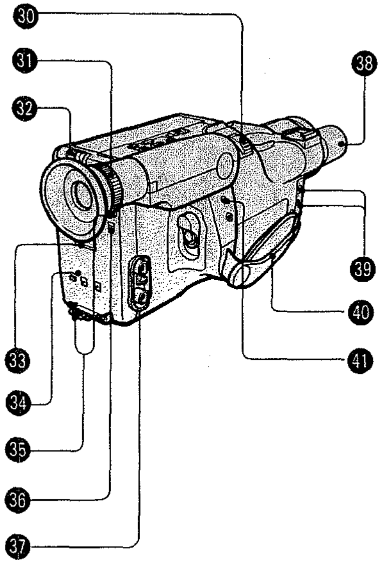
A-5

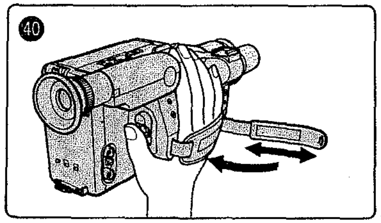
㉘ **Tripod receptacle**

Note when attaching a tripod
When attaching a tripod, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera.

㉙ **Lens Cap**

A-6





Identifying the Basic Parts

A-6

㉚ **Power zoom button** (page 32)

㉛ **Viewfinder lens adjustment ring** (page 16)
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

㉜ **I▶ (cassette eject) button** (page 15)

㉝ **Lithium battery compartment** (page 14)

㉞ **Battery mounting surface**

㉟ **Hooks for shoulder strap**
Attach a shoulder strap.

㊱ **REC MODE (recording mode)/EDIT switch**
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	SP LP	EDIT	EDIT
Function	REC MODE switch	EDIT switch	

㊲ **VIDEO/AUDIO OUT (output) jacks (phono jacks)**
RFU adaptor DC output jack (special minijack)
Supplies power to the M 8 RFU adaptor.

㊳ **Built-in microphone (monaural)**

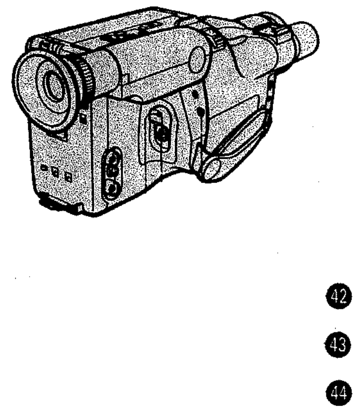
㊴ **MIC jack and DC OUT (microphone power output) jack**
Connect an external microphone.
The MIC jack accepts "plug-in-power" microphones and supplies power to them.

㊵ **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

㊶ **RC (remote control) connector (stereo mini-minijack)**

Identifying the Basic Parts

A-7



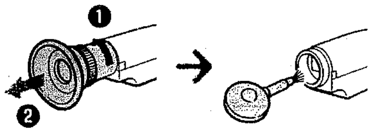
A-7

(42) **∩ (earphone) jack (minijack)**

(43) **Start/stop button**
Press to start and stop camera recording.

(44) **⏻ (standby)/LOCK switch**
Slide up to set the unit to recording pause mode.

A-8



To remove dust from inside the viewfinder A-8
Detach the eyecup as illustrated and clean the surface of the screen with a blower.

Power Sources and Cassette Care

Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor NA 8 (supplied) (page 12)
	Outdoors	Battery pack	Battery pack BP 8-1 or BP 8-2 (page 10)
	In the car	12 V or 24 V car battery	DC pack* (page 13) Car battery cord is supplied.

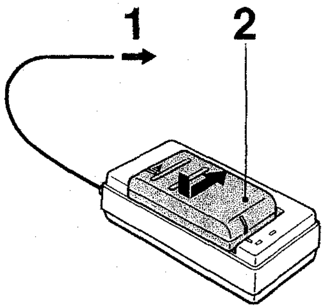
Notes on power source
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touch on the metal part on the battery pack or AC power adaptor. When the battery pack is not being used, keep it in its case.

*Available in near future

Power Sources

Battery Pack — BP 8-1 or BP 8-2

B-1

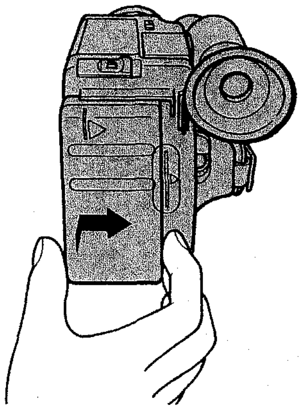


First, charge the battery pack B-1
Use the supplied NA 8 AC power adaptor.
The charging time is about 1 hour for a BP 8-1 battery pack, or about 2 hours for a BP 8-2 battery pack.

1. **Connect the NA 8 to a wall outlet.**

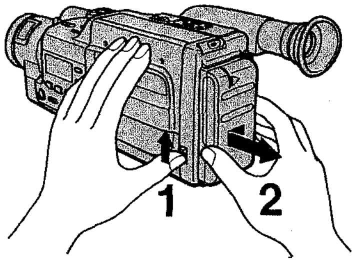
2. **Attach the battery pack to the NA 8.**
Align the grooves on the battery pack with those on the NA 8, and while pressing the battery pack slide it as illustrated.

B-2



To attach the battery pack to the video camera recorder B-2
Align the right side of battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

B-3



To remove the battery pack B-3
While pressing the BATT knob in the arrow direction, slide to the left and pull out the battery pack as illustrated.

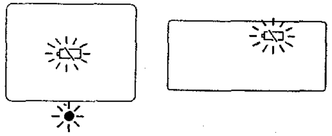
Battery life
A fully-charged BP 8-1 battery pack provides approximately 40 minutes of continuous camera recording, and a BP 8-2 provides approximately 80 minutes of continuous camera recording.

Notes
- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
When recording is not to be started soon, turn off the power with the ⏻/LOCK switch.
- If the battery pack is not fully charged or if it is used in a cold place, or if the metal parts on the battery pack and the camera are dirty, its operating time is also shortened.

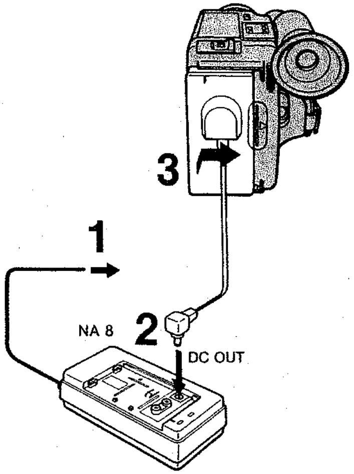
When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

When the battery becomes weak B-4
The 🪫 indication and red lamp blink in the viewfinder and the 🪫 indication blinks in the display window.
Replace the battery pack with the fully charged one.

B-4



B-5



Power Sources

House Current — Using AC Power Adaptor B-5

1 Connect the AC power adaptor to a wall outlet.

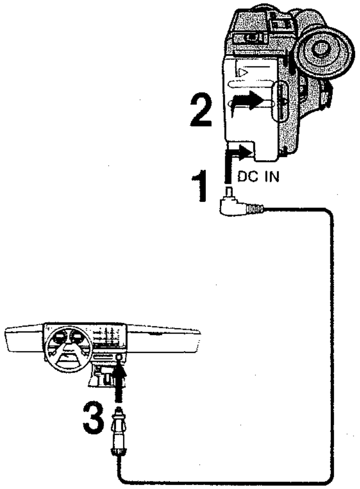
2 Insert the connecting cord supplied with the NA 8 AC power adaptor into the DC OUT jack on the AC power adaptor.

3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide to the left and pull out the connecting plate.

S 10

B-6



Power Sources

Car Battery — Using the DC Pack B-6

1 Insert the car battery cord supplied with the pack into the DC IN jack on the DC pack.

2 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.

3 Connect the car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

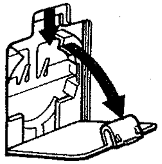
To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide to the left and pull out the DC pack.

Power Sources

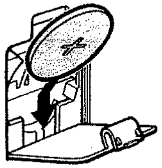
Lithium Battery C-1

C-1

1



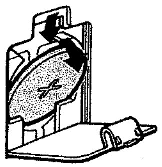
2



To insert the lithium battery
This unit uses a lithium battery to activate the clock and to keep a title in memory. Before operating the unit for the first time, install the supplied lithium battery:

1. **Open the cover of the lithium battery compartment on the battery mounting surface.**
2. **Install the supplied CR2025 lithium battery with the ⊕ side facing out.**
3. **Close the cover.**

C-2



To remove the lithium battery C-2
Press the side of the battery in the direction as indicated for installation.

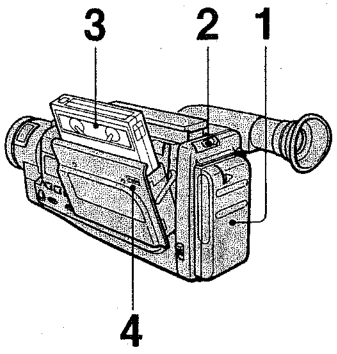
Lithium battery life
Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink in the display window and on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a CR2025.

Notes on lithium battery
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.
- Even when the lithium battery is installed, the display window will not light unless power is supplied to the unit.

WARNING
Battery explodes if mistreated.
Do not recharge, disassemble or dispose of in fire.

Cassette Care

D-1



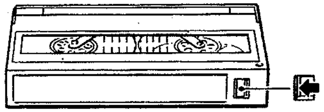
Cassette Insertion D-1

1. **Connect a power source.**
2. **Pressing the small button, slide the I▶ button in the arrow direction.**
   The cassette holder will open.
3. **Insert a cassette with the window facing outside.**
4. **Close the cassette holder.**

Cassette Ejection D-1

1. **Make sure that a power source is connected.**
2. **Pressing the small button, slide the I▶ button in the arrow direction.**
3. **Take out the cassette.**
4. **Close the cassette holder.**

D-2



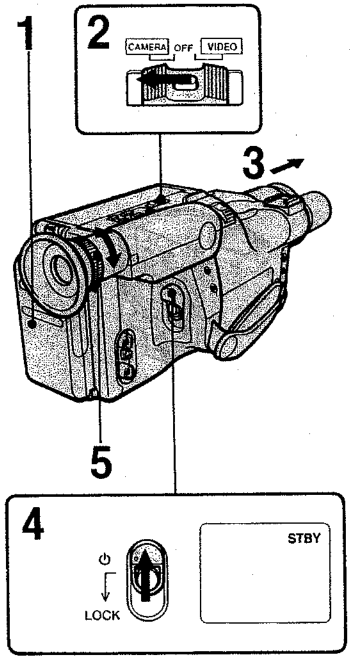
To Prevent Accidental Erasure D-2

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

Notes
- Don't press the upper lid of the cassette compartment forcibly when it is moving.
  When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

E



Camera Operation

Adjustment of the Position of the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. E

1 **Connect a power source.**

2 **While pressing the small button, set the POWER switch to CAMERA.**

3 **Remove the lens cap.**

4 **Slide the ⏻/LOCK switch up.**

5 **Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.**

Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

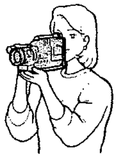
Notes

- **If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the ⏻/LOCK switch down once and slide it up again.**
- For "once-only" events, it is strongly recommended to have a trial run to check that everything is working perfectly.
- PCM recording/playing is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

Easy Camera Recording with Automatic Adjustment

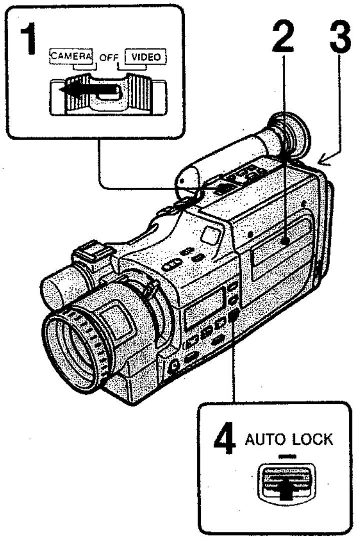
How to Record

F-1



Hold the camera recorder as in the illustration.
If your nose touches the recorder, adjust the angle of the viewfinder. F-1

F-2



F-2

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Insert the cassette.**

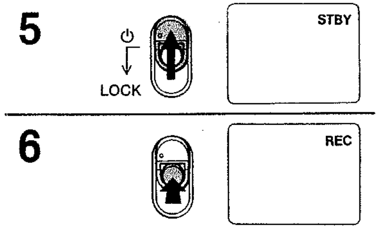
3 **Set the REC MODE/EDIT switch to LP or SP,** according to the length of the programme to be recorded.
The recording time of a cassette in the LP mode is twice as long as that in the SP mode.

4 **Set the AUTO LOCK switch to upper AUTO LOCK position.**

5 **Slide the ⏻/LOCK switch up.** F-3
The unit will enter the recording pause mode.

6 **Press the Start/stop button.**
Recording will start.

F-3



Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

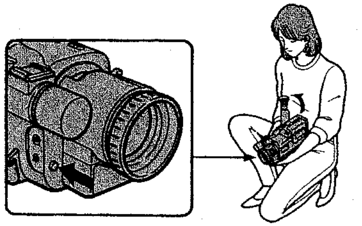
To stop recording
Press the Start/stop button again.
The unit will enter the recording pause mode.
Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

To check the last portion of the previous recording

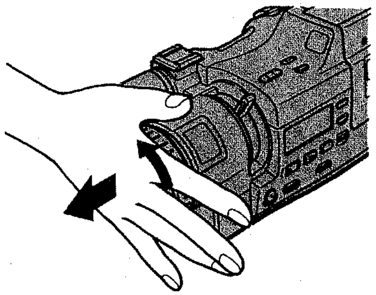
1 **Set the recorder in recording pause mode by pressing the Start/stop button.**

2 **Press the "–" side of the EDIT SEARCH button (REC REV) momentarily.**
The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

F-4



F-5



If the picture has not been recorded
The video head may be contaminated. Clean the heads using a video head cleaning cassette.

After using
Slide the ⏻/LOCK switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

F-4

For low position recording
The viewfinder can be turned up 90 degrees.

1 **Slide the ⏻/LOCK switch up.**

2 **Press the START/STOP button on the front.**

When removing the lens hood, press it with the palm of your hand and turn it counterclockwise. F-5

Note on power source
If the POWER switch is moved during recording, the tape will stop.

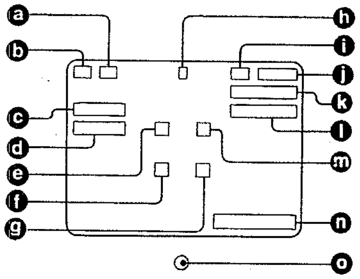
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VTR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment
- During recording, do not cover the white balance sensor, infrared beam emitter and detector.
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens and the white balance sensor clean.

Under certain conditions, auto focusing will not operate properly (see page 25).

F-6



Indications inside the Viewfinder and in the Display Window F-6 F-7

ⓐ ▨ **(Back light)**
The indication lights while the BLC button has been pressed.

ⓑ ☀, ☼ **(White balance)**
When the indication does not light, the white balance is set to auto.

ⓒ **Shutter speed**

ⓓ **FADER**

ⓔ ▭
The indication blinks slowly when the battery is weak and blinks rapidly when the battery is exhausted.

ⓕ ▣ **(Dew)**
The indication blinks when moisture condensed inside the unit.

ⓖ ⏏
The indication blinks when the unit cannot function normally.
⊗
The indication blinks when the gap of the head is clogged. Clean the heads using the video head cleaning cassette.

ⓗ ■
The indication lights while manual focusing. The indication blinks while auto focus function does not operate correctly.

ⓘ SP/LP
The indication of tape speed

ⓙ **STBY/REC**
The indication lights in the following modes.
STBY
Recording is momentarily stopped (recording pause mode).
REC
recording is going on.

ⓚ **Tape counter**

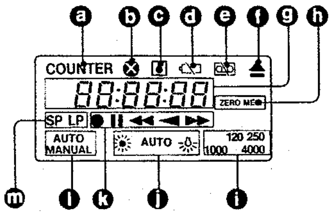
ⓛ **ZERO MEM**
The indication blinks when the DISPLAY MEMORY button is pressed.

ⓜ ▭ **(Tape end)**
The indication blinks slowly when the tape is out or close to the end. The indication blinks rapidly when the tape is at its end.

ⓝ **Date or Time**

ⓞ **Camera recording/battery lamp**
The indication lights during camera recording. It blinks when the battery is weak.

F-7



Easy Camera Recording with Automatic Adjustment

F-7

ⓐ COUNTER indicator
ⓑ Blinks when the slit in the head is clogged.
ⓒ Moisture condensation inside the unit.
ⓓ Blinks when the battery is weak.
ⓔ Lights steadily when no cassette is inserted. Blinks when the tape approaches its end or the safety tab of the inserted cassette is slid out (red).
ⓕ Light steadily during cassette ejection. Blinks when the unit cannot function normally.
ⓖ Indicates the date time or the tape counter.
ⓗ ZERO MEM (memory) indicator
ⓘ Shutter speed indicator
ⓙ White balance indicator
ⓚ Tape operation mode indicators
ⓛ Recording mode indicator
ⓜ Tape speed indicator

Function of the AUTO LOCK Switch

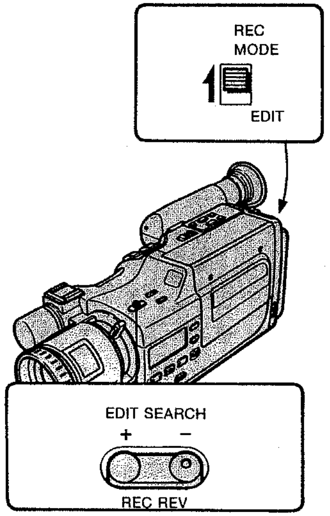
When the AUTO LOCK switch is set to upper AUTO LOCK position (green position), the white balance, shutter speed (1/50), and focus are adjusted automatically, and the back light function does not work. But under certain circumstances manual adjustment is better for effective recording.

When the AUTO LOCK switch is set to the lower position, each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder and display window changes.	
WHITE BALANCE See page 28.	No indication (Auto) → ☀ → ✧
SHUTTER See page 30.	No indication (1/50) → 120 → 250 → 1000 → 4000
FOCUS See page 24.	No indication (Auto) → ■ (Manual)
BLC See page 29.	No indication → ▨

Notes
- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the lower position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the lower position again, the previous manual setting will be recalled.

F-8



Easy Camera Recording with Automatic Adjustment

Instant Playback on the Spot F-8

You can monitor the picture just recorded on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide the ⏻/LOCK switch up.**

3 **Set the REC MODE/EDIT switch to the upper position.**

4 **Press the "−" side of the EDIT SEARCH button to reverse the picture.**

5 **Press the "+" side of the EDIT SEARCH button to view the playback picture.**

To resume recording in the LP mode, slide the REC MODE/EDIT switch down.

During Recording, to Record Again on the Previous Recorded Portion

1 **Slide the ⏻/LOCK switch up.**

2 **Set the REC MODE/EDIT switch to the upper position.**

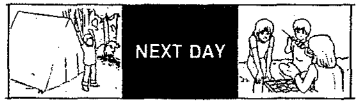
3 **Locate the point from which the recording is to begin again by monitoring the picture on the viewfinder screen.**
   ❶ Press the "+" side of the EDIT SEARCH button to advance the picture at a normal playback speed, or the "−" side to reverse the picture.
   ❷ At the desired point, release the EDIT SEARCH button.
   The unit will be set to recording pause mode.

4 **Set the REC MODE/EDIT switch to the previous recording mode.**

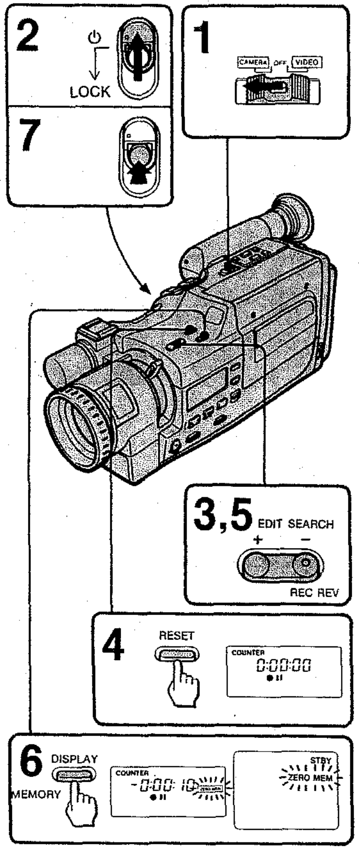
5 **Press the START/STOP button to start recording.**

Smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as above.

G-1



G-2



Insert Recording

— Using EDIT SEARCH button —

You can insert (record) video and audio simultaneously from the camera onto any recorded tape. G-1

Operation G-2

- Monitor the picture being inserted on the viewfinder screen.
- Select the same tape speed as was used for already recorded portion with the REC MODE/EDIT switch.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide the ⏻/LOCK switch up to set the unit to recording pause mode.**

3 **Keep pressing the "+" or "−" side of the EDIT SEARCH button and release the button at the point where the insert should end.**
The unit will be set to recording pause mode.

4 **Display the counter in the display window and press the RESET button.**
The counter is reset to zero.
(For an accurate ending point, press the RESET button immediately after the EDIT SEARCH button is released and while the still picture is displayed.)

5 **Keep pressing the "−" side of the EDIT SEARCH button and release the button at the point where the insert should begin.**

6 **Press the DISPLAY MEMORY button. The insert ending point is stored in memory.**

7 **Press the Start/stop button.**
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the DISPLAY MEMORY button so that the ZERO MEM indicator disappears.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the Start/stop button.

Insert Recording

Notes on ZERO MEM Mode
ZERO MEM mode is cancelled automatically in the following cases.

- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

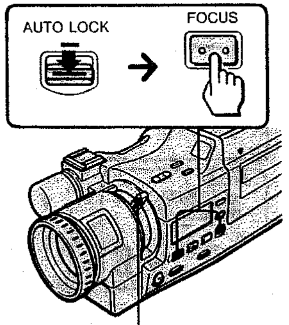
To restore it, follow the steps 1 through 6 again.

Notes

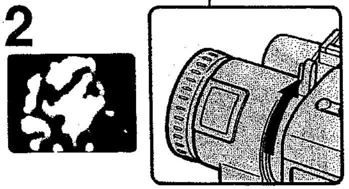
- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

H-1

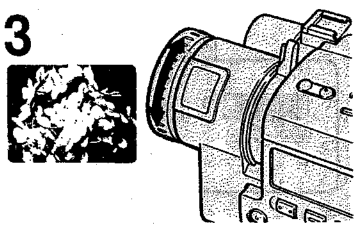
1



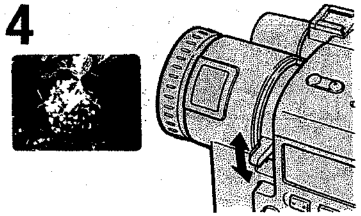
2



3



4



Manual Focusing

Use manual focusing when shooting subjects are difficult to focus automatically (listed on page 25).

H-1

1 **Set the AUTO LOCK switch down and press the FOCUS button to set the manual focusing.**
The previous manual focusing setting will be recalled.

2 **Turn the manual zoom lever to the telephoto position (68) to make the subject as large as possible in the viewfinder.**

3 **Turn the focus ring to achieve sharp focus.**

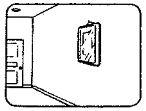
4 **Set the desired shot length using the manual zoom lever.**

Some helpful hints

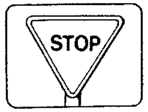
- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position (8.5) and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the Φ mark.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

H-2

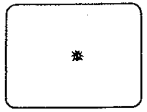
[a]

[b]


[c]

[d]


[e]

[f]


[g]

[h]

Manual Focusing

Poor Conditions for Auto Focusing H-2

To shoot subjects listed below you must use manual focusing.

[a] Black objects which absorb the infrared beam
Ex. dark curtains or shade

[b] Objects in which the infrared reflection disperses
Ex. a smooth slanting surface (Auto focusing functions when the camera is aimed squarely at the subject.)

[c] Objects in which the infrared reflection is not sufficient
Ex. bushes, grass or plants in the telephoto position

[d] Objects in which the infrared beam is reflected too much
Ex. traffic signs, a white wall, a mirror, or a subject through plate glass

[e] Objects not solid
Ex. fireworks, candle flame or smoke

[f] Extremely small objects which do not cover more than $^{1}/_{10}$ of the viewfinder's area
Ex. insects

[g] When there are other objects between the shooting object
Ex. an animal inside a cage or baby inside a cot

[h] Moving objects
Ex. a crowd or sports with lots of movement

- **Objects which emit infrared beams themselves**
  Ex. automatic doors or fluorescent lights
- **Objects more than 15 meters (49 feet) away from the recorder**

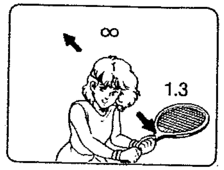
Manual Focusing

Other Uses of Manual Focusing

- When using special effects lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (When the AUTO LOCK switch is set to upper AUTO LOCK position, the auto focusing operates to move the focus ring automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 33.

Auto focusing system of this camera recorder
This recorder adjusts focus automatically by emitting an infrared beam at the objects to be shot and then detecting the reflected beam. When the subject is approximately 3 meters away from the camera recorder, the focus is sharpest in the centre of the screen. The camera recorder has the tendency, however, to focus a bit lower to the right when the subject is within 3 meters, and a bit higher to the left when the subject is more than 3 meters away. H-3

H-3



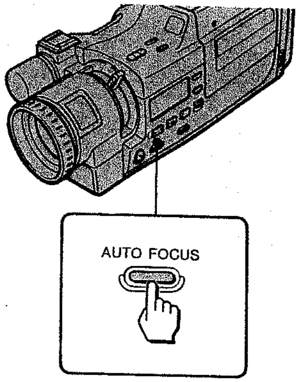
Note
As the auto focusing of this camera recorder utilizes an infrared beam, it might malfunction when you use the camera recorder near another equipment that also emits an infrared beam such as a TV or VTR Remote Commander, or another camera recorder that uses an infrared beam for auto focusing.
It might also cause malfunctioning of such equipment.

Instant Auto Focus during Manual Focusing H-4

While recording in manual focusing, you can switch to the automatic focus mode, depending upon the shooting condition, by pressing the AUTO FOCUS button. The automatic focus function is active while the button is pressed.

To return to the manual focusing, release the AUTO FOCUS button.

H-4



White Balance Function

Automatic White Balance Function

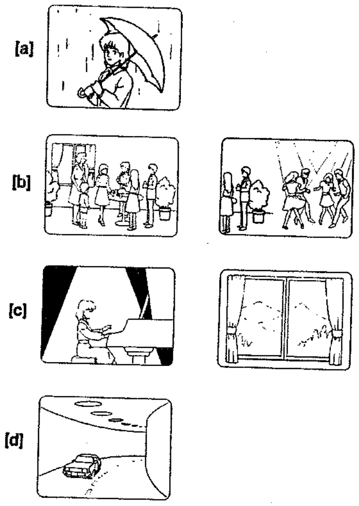
In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

Manual White Balance Function

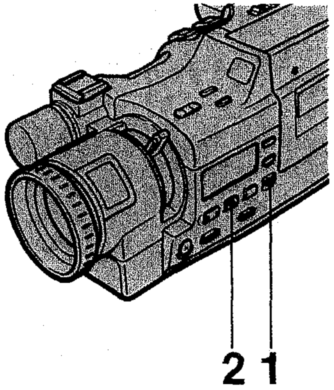
I-1

Poor condition for automatic white balance function are listed below.
[a] Insufficient light
[b] When lighting conditions change quickly
[c] When the light source for the subject is different from that illuminating this unit e.g. when the subject is in a spotlight, or when the subject is outdoors but the camera is indoors, etc.
[d] Special light sources such as natrium lamps, the setting sun, etc.

I-1



I-2



White Balance Function

How to Use the Manual White Balance Function I-2

1 **Set the AUTO LOCK switch down.**
The white balance mode is the same as the previous mode.

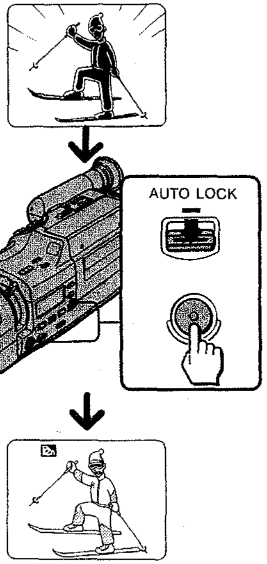
2 **Press WHITE BALANCE button once or twice so that the appropriate white balance indicator appears on the viewfinder screen.**
To record the subject indoors (3200 K): 💡
To record the subject outdoors (5800 K): ☀

Recommended setting for various subjects
indoor: coming in from outdoor to indoor, candle flames in darkness, subjects in the spotlight, scenes before sunrise, subjects in a tunnel (illuminated by natrium lamps), neons, etc.
outdoor: getting out from indoor to outdoor, sunset, fireworks, subjects in a sunny window, etc.

Note
Do not cover the white balance sensor.

Each push of the WHITE BALANCE button cyclically changes each function.	
Display window	AUTO → ☀ → 💡
Viewfinder screen	No indication → ☀ → 💡

J



Back Light Adjustment J

In this unit iris is automatically controlled. However, when shooting a subject that is backlit, that is the light source is coming in from the back of the subject, you should do the following steps.

1 **Set the AUTO LOCK switch down.**
The previous back light mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

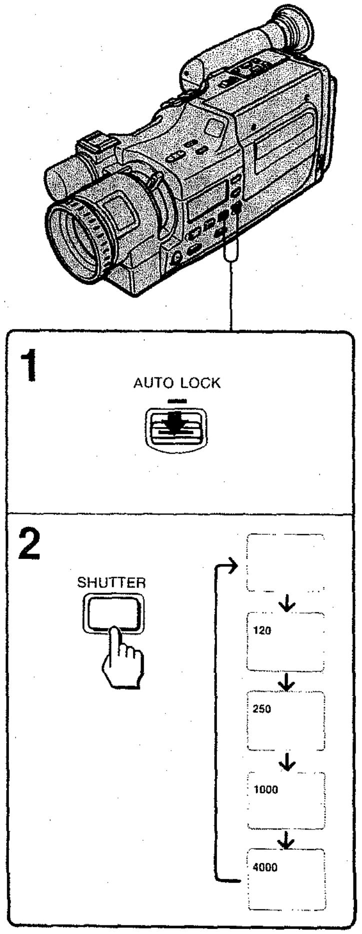
2 **Press the BLC button.**
The ▨ indication appears in the viewfinder screen.

After shooting that particular scene, be sure to press the BLC button again to release it. Otherwise the recorded picture will be too bright.
The ▨ indication goes out.

[K-1]

[K-2]

[K-3]



Shutter Speed Adjustment

When a fast-moving subject is recorded at a normal shutter speed, its still picture may not be seen when played back [K-1]. This can be improved by increasing the shutter speed [K-2].
The shutter speed of this unit can be selected from five speeds, 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/4000.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.
Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	**Recommended shutter speed**
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • Recording the skiers	1/4000 or 1/1000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/120

[K-3]

1 Set the AUTO LOCK switch down.
The previous shutter speed mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

2 Press the SHUTTER button repeatedly until the desired shutter speed indication appears on the viewfinder screen and in the display window.
Each time the SHUTTER button is pressed, the indication changes:

No indication → 120 → 250 → 1000 → 4000
(1/50) (1/120) (1/250) (1/1000) (1/4000)

When the picture in the viewfinder is dark at the high shutter speed, auto focus will not function correctly. In this case, use the manual focusing.

Shutter Speed Adjustment

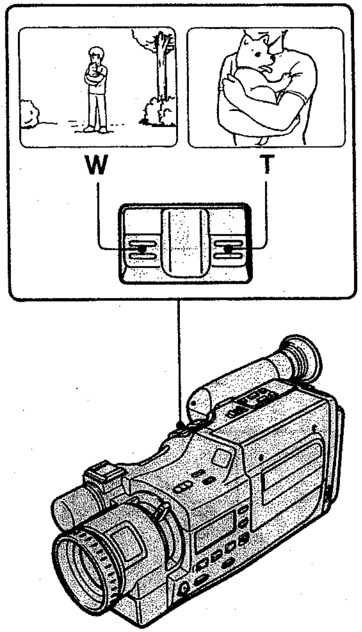
Notes

- When shutter speed 1/250 or more is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
  If flickers of fluorescent lamps affect the recording in 60 Hz areas, set the shutter speed to 1/120.
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

Zooming

The size of the subject in the scene can be changed.

L-1

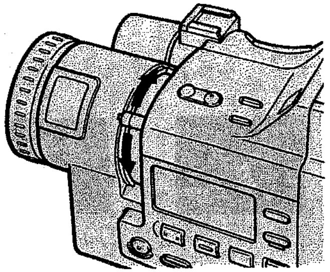


Power Zoom L-1

— for smooth and constant zooming

Press the "T" side of the power zoom button for telephoto and the "W" side for wide-angle. The zoom lever will move automatically.

L-2



Manual Zoom L-2

— to create a dramatic effect

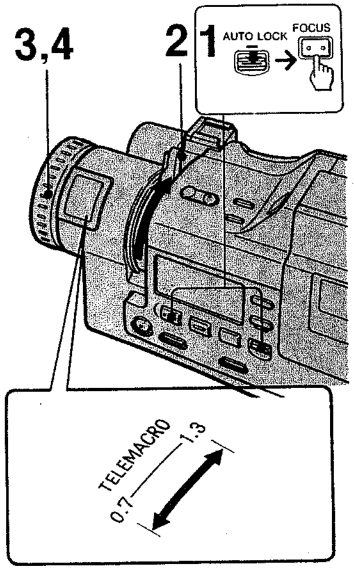
Turn the manual zoom lever upward for telephoto and downward for wide-angle.

Zooming effect
The focal length of this unit is 8.5 mm to 68 mm. Converted into the focal length of a 35 mm camera, this means approximately f-43 mm to 340 mm.

Close-ups (Macro)

Even tiny objects can literally fill the screen for dramatic close-up effects.
Remove the lens hood before operation.

M-1



Tele-Macro Shooting M-1

Using this setting, you can obtain close-up effects within 0.7 to 1.3 meters from the subject.

1 **Set the AUTO LOCK switch down and press the FOCUS button to set to the manual focusing.**

2 **Turn the zoom lever to the telephoto end position** (68).

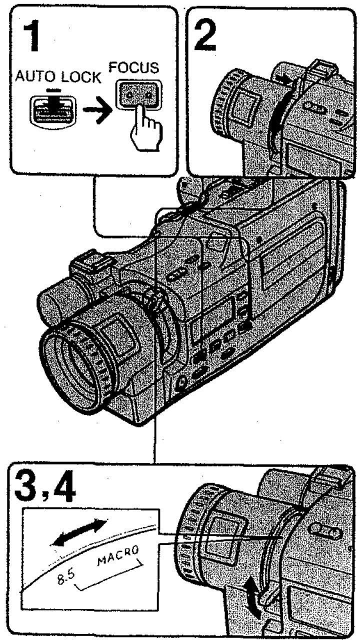
3 **Turn the focus ring within the TELEMACRO range** (1.3–0.7).

4 **Turn the focus ring to bring the subject into sharp focus.**

Note
If you turn the zoom lever from the telephoto end position to wide, the screen may become dark.

Close-ups (Macro)

M-2



Wide-Macro Shooting M-2

The subject can be as close as 1 cm. A dramatic close-up effect can be obtained with a deeper field than that of the tele-macro shooting.

1 **Set the AUTO LOCK switch down and press the FOCUS button to set to the manual focusing.**

2 **Turn the zoom lever to the wide-angle position.**

3 **Turn the zoom lever to the MACRO range, while pressing the green macro set button.**

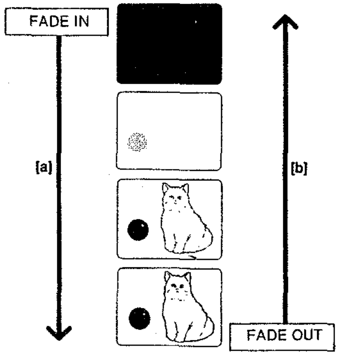
4 **Turn the zoom lever within the MACRO range in order to focus sharply.**

Notes

- When shooting in macro, the depth of field is very shallow, so care must be taken to focus sharply. To keep the subject in focus, use a tripod or monopod to maintain stable picture.
- Zooming is not possible during wide-macro recording. To change the size of the subject, move the camera recorder closer or further away.

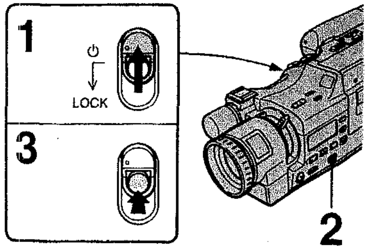
Fade-in and Fade-out Function

N-1



When fade-in, the picture and sound will gradually fade-in from a black background [a]. When fade-out, the picture and sound will gradually fade out to black. [b]
A natural beginning and ending effect can be added by using fade-in at the beginning of a recording and fade-out at the end of a recording.

How to Fade-in N-2

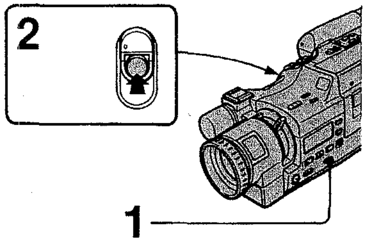


1 **Slide the ⏻/LOCK switch up to set the unit to the recording pause mode.**

2 **Press the FADER button.**

3 **Press the Start/stop button.**
Fade-in will be performed and recording will start.

How to Fade-out N-3



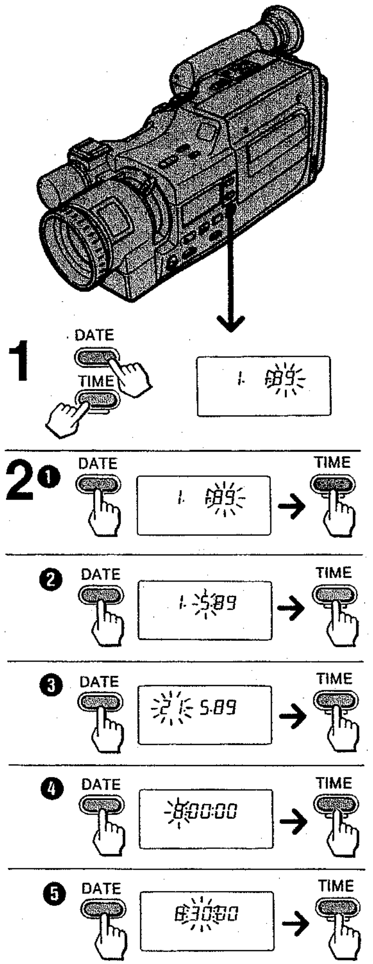
1 **While recording, press the FADER button.**

2 **Press the Start/stop button.**
Fade-out will be performed and then recording will stop.

To cancel the fade-in and fade-out function
Before pressing Start/stop button, press the FADER button again.

Note
Fade-in or fade-out is cancelled automatically after it has been performed.

O-1



Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that power sources and lithium battery are installed.

If you install a new lithium battery, re-set date and time again.

To Set Date and Time O-1

1 **Press the DATE and TIME buttons simultaneously for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode.)
The DATE button now functions as the + button and the TIME button functions as the next button.

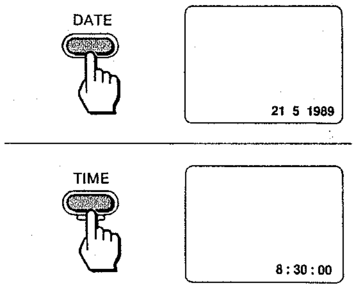
2 **Adjust ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.**
First adjust the blinking digits with the DATE (+) button, and then press the TIME (next) button. After adjusting the minute digits, press the TIME (next) button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

The DATE (+) button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

To clear the time indication from the display
Press the TIME (next) button again.

O-2



To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes out.

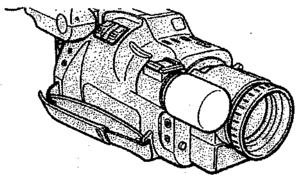
To readjust an incorrect date or time
Set the unit to date/time setting mode and press the TIME (next) button repeatedly until the incorrect digit blinks. Correct it with the DATE (+) button and press the TIME (next) button. After adjusting the minute digits, press the TIME (next) button at the same time with an announced time signal.

To Record the Date or Time O-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

P



S 23

Use of the BUILT-IN MIC P

The built-in microphone is an omni-directional microphone.

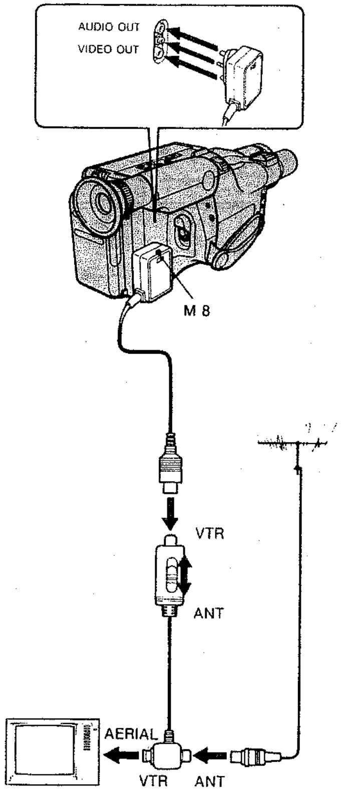
A variety of optional microphones.

- Omni-directional microphone: To pick up sounds equally from all directions
- Uni-directional microphone: To pick up specific sounds
- Supercardioid microphone: To isolte a sound
- Zoom microphone: To allow the field of recording to be changed.

Note

The built-in microphone will not operate when an optional microphone is connected to the MIC jack.

Q-1



PLAYER Operation

Preparation for Playback

Connecting a TV without audio/video input connectors Q-1

1 **Connect the M 8 RFU adaptor to the VS 8000.**

2 **Connect the aerial, VS 8000 and TV to the aerial selector** (supplied with the M 8). Use a 75-ohm coaxial cable for aerial connection.

3 Set the I/G selector according to the TV system of your country.

4 **Adjust one of the TV programme positions to receive the signal from the video camera recorder.** See "Adjusting the TV" below.

5 **Set the selector switch on the aerial selector as follows:**

For viewing a playback picture → VTR
For viewing TV programmes → ANT

6 **Select the same programme position on the TV as that selected in adjusting the TV.**

Preparation for Playback

Adjusting the TV with the M 8

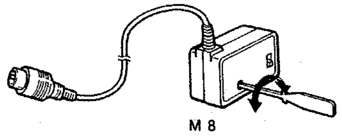
1. Turn on the TV and select a programme position which is not being used to receive a TV station.
2. Set the POWER switch of the VS 8000 to CAMERA and slide the ⏻/LOCK switch up.
3. Set the selector switch of the aerial selector to VTR.
4. Tune the TV until you see the picture and hear the sound from the VS 8000.

If the playback picture is not free of disturbance

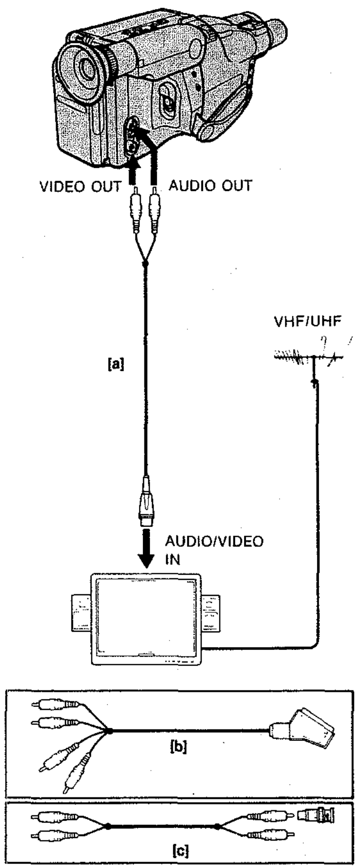
1. Set the selector switch of the aerial selector to ANT.
2. Adjust the programme position of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3. Set the selector switch of the aerial selector to VTR.
4. Slowly turn the RF channel of the M 8 with the supplied screwdriver, until the picture from the VS 8000 becomes clear. Q-2
Now the TV adjustment is complete.

S 24

Q-2



Q-3



Preparation for Playback

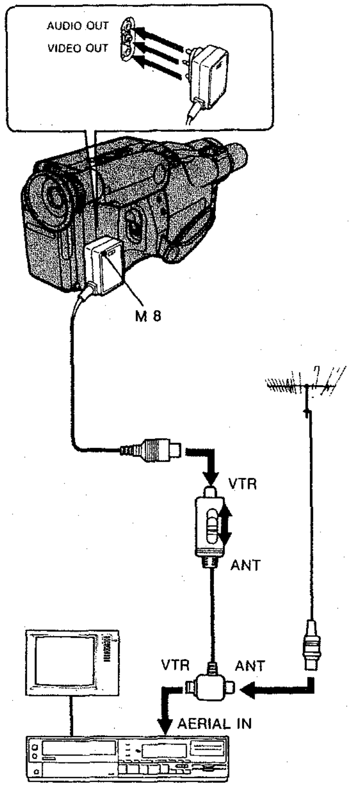
Connecting a TV (or colour monitor) equipped with audio/video input connectors Q-3

Leave the TV aerial cable connected to the TV.

1. **Connect the VS 8000 to the TV using an optional connecting cable to match the connectors on the TV.**
   - [a] to a 6-pin DIN connector
   - [b] to a 21-pin connector (EURO-CONNECTOR)
   - [c] to phono and BNC-type connectors
2. **Set the TV/VIDEO selector button on the TV as follows:**

For viewing a playback picture → VIDEO
For viewing TV programmes → TV

Q-4



Preparation for Playback

Connecting a TV connected to another VTR without an input selector Q-4

Connect the M 8 RFU adaptor to the VS 8000.

1 **Connect the M 8, aerial, and the VTR to the aerial selector** (supplied with the M 8). Use a 75-ohm coaxial cable for aerial connection.

2 Set the I/G selector according to the TV system of your country.

3 **Adjust one of the TV programme positions to receive the signal from the video camera recorder. See "Adjusting the TV" on page 40.**

4 **Set the selector switch on the aerial selector as follows:**

For viewing a playback picture → VTR
For viewing TV programmes and playback picture of the VTR → ANT

5 **Select the same channel on the TV as that selected in adjusting the TV.**

Connect the others as shown in the illustration.

Playback

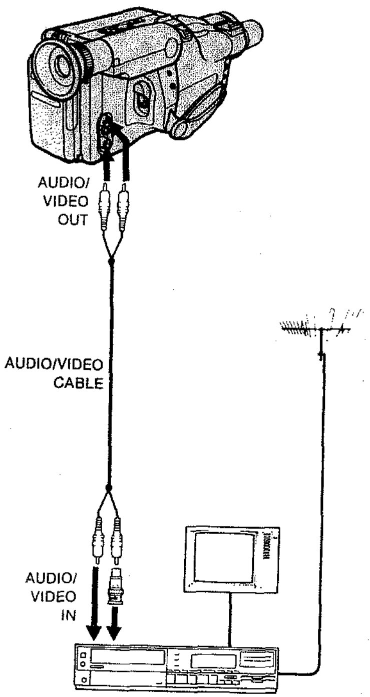
1 **Turn on the TV.**

2 **While pressing the small button, set the POWER switch on the VS 8000 to VIDEO.**

3 **Set the selector switch on the aerial selector to VTR and select the channel for the VTR on the TV.**

4 **Insert a cassette into the VS 8000 and press the ◄ button. Playback will start.**

Q-5



Preparation for Playback

Connecting a TV connected to another VTR with an input selector Q-5

Use an audio/video cable.

Set the selector on the VTR as follows:
Input selector → LINE
TV/VTR selector → VTR

Note
When the VTR to be connected has stereo audio inputs, use a stereo connecting cord.

Playback

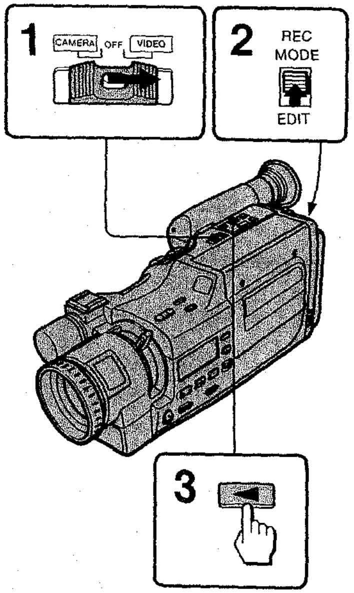
1 **Turn on the VTR and TV.**

2 **While pressing the small button, set the POWER switch on the VS 8000 to VIDEO.**

3 **Set the input selector on the VTR to LINE and select the channel for the VTR on the TV.**

4 **Insert a cassette into the VS 8000 and press the ◄ button. Playback will start.**

R-1



Playback

Turn on the TV (or colour monitor), and select the programme position for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

R-1

1 **While pressing the small button, set the POWER switch to VIDEO, and insert a cassette.**

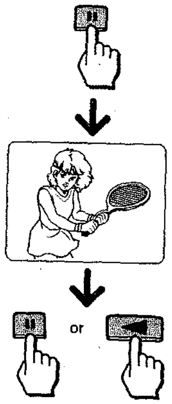
2 **Set the REC MODE/EDIT switch in the upper position.**
The unit detects the recorded mode of the tape, and adjusts the tape speed automatically.

3 **Press the ◄ button.**
Playback will start.

To stop the tape, press the ■ button.

After using, be sure to set the POWER switch on the recorder to OFF.

R-2



Playback

To view a still picture R-2
Press the ❚❚ button during playback. To resume playback, press the ❚❚ button again or the ◄ button.

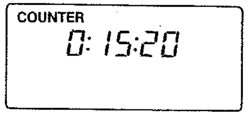
Monitoring a High-Speed Picture

During playback — Picture Search

1 **In the playback mode, press the ◄◄ or ►► button.**
The picture will be monitored at high speed as long as it is kept pressed.

2 **Release the ◄◄ or ►► button at the desired point.**
Normal playback will resume.

S-1



Use of the Tape Counter

During recording or when a tape recorded in the SP mode is played back, the digits on the counter indicate the actual recording or playback time. When a tape recorded in LP mode is played back, the counter counts approximately half the actual playback time.

E.g. When the counter indicates "0:15:20" during playback of an LP recorded tape, the tape was played back for approximately 30 minutes 40 seconds from the counter zero position. S-1

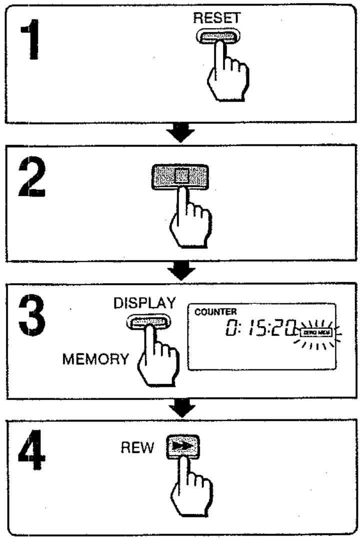
To Index the Whole Tape

Press the RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly.
- The counter also operates for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations or after playing back in slow mode for a long time.

S-2



Use of the Tape Counter

To Return to a Pre-registered Point S-2

1 **During recording or playback, press the RESET button at the point you later want to locate.**

2 **Press the ■ button when the recording or playback has finished.**

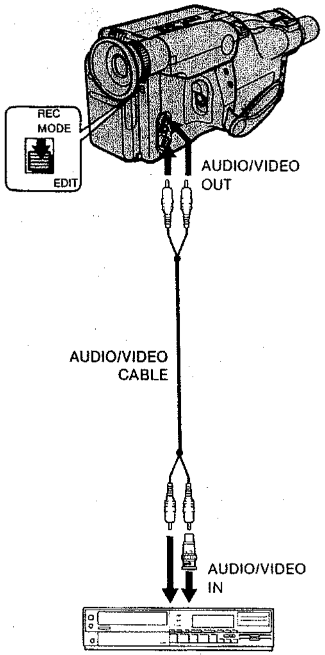
3 **Press the DISPLAY MEMORY button. The "ZERO MEM" indicator will blink in the display window.**

4 **Press the ▶▶ or ◀◀ button.**
The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes

- The DISPLAY MEMORY button does not function during recording or playback mode.
- Be sure to press the DISPLAY MEMORY button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

T



Tape Editing

To edit a home movie tape, you will need another VTR.

To Edit from the VS 8000 to Another VTR T

1. **While pressing the small button, set the POWER switch on the VS 8000 to VIDEO and turn on the other VTR.**
2. **Slide the REC MODE/EDIT switch on the VS 8000 to EDIT.**
3. **Set the input selector on the VTR to LINE.**
4. **Press the ❚❚ button on the VS 8000 during playback at the point where you want to start recording.**
5. **Press the record button on the other VTR, pressing the ❚❚ button.**
6. **Release the ❚❚ buttons on both units.**
   Recording will start.

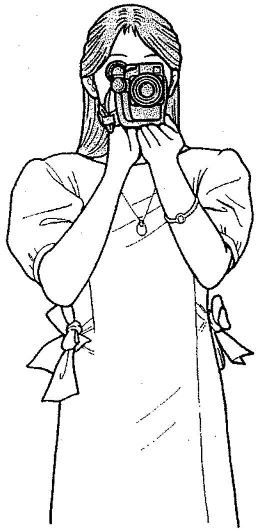
When the VTR to be used is a stereo type, use a stereo connecting cord.

After editing, turn off both units and be sure to slide the REC MODE/EDIT switch to the upper position.

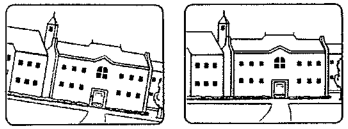
To cut off an unnecessary portion
Press the ❚❚ button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

Function of the REC MODE/EDIT switch
Slide this switch down whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the upper position.

A



B



General

Hints for Better Shooting

Basic Camerawork

Getting stable pictures A

For hand-held shots, holding the recorder properly is the key.

- Hold the recorder firmly and secure it with the grip strap so that it is easy to manipulate the recorder with your thumb.
- Breathe gently.
- Place your right elbow firmly against your side.
- Stand opposite to the subject and plant your feet firmly in a comfortable position.
- Place your eye firmly against the viewfinder eyecup.
- Try to keep both eyes open.
- Place your left hand under the camera recorder to support it. When adjusting the focus manually, make sure the unit does not move.
- Do not cover the white balance sensor and infrared beam detector and emitter.

Use a tripod or monopod if possible

If you have a tripod for your still camera, it can also be used with the video camera recorder. Use a sturdy one.
If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.

Keeping the horizontal plane level B

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.

The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Hints for Better Shooting

Lighting

Try to shoot scenes with the sun at your back

When shooting a scene when the light source is in back of the subject, the subject will be recorded too dark and the background too light.

The followings are also backlight conditions:

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- A person wearing white or glossy clothes in front of a white background. In this case, the face will be recorded too dark.

For the sharpest pictures, you need the best light

For the most brilliant colour in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

What kind of light is best? Choosing the right lights

Photography lamps or halogen lamps are recommended.
For lighting of a wide area for easy use—reflector flood light
To emphasize the subject—use a reflector spotlight.

Precautions for using lights

Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Hints for Better Shooting

Brightness Levels

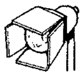
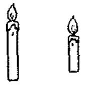
The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

ND filter required	Unit: lux	Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	100,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	10,000	Overcast day, one hour after sunrise (2,000)
	1,000	Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500–700)
	500	Station wicket (650) Office lit by fluorescent lamps (400–500) Room lit by two 30 W fluorescent lamps (300)
Video light recommended	300	Subway station platform (300)
	100	Arcade at night (150–200)
Video light required	10	Theater lobby (15–35) Candle light (10–15)

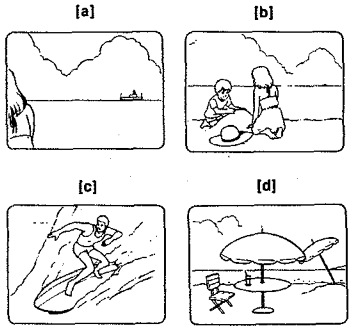
Hints for Better Shooting

Colour temperature — how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light colour." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the colour temperature, which in turn stands for "light colour." As colour temperature increases, the light colour changes from red to yellow to white to blue.

Natural light colour temperature (K)		Colour change			Artificial light colour temperature (K)	White balance adjustment
Clear sky Slightly overcast		10,000(K)	⇧	10,000(K)		
		8,000		8,000		
			Blue			
Cloudy, rainy		7,000		7,000		
					Fluorescent lamp (colour matching)	
		6,000	⇕	6,000		☀ Outdoor mode
					Fluorescent lamp (daylight white)	⇕
		5,000		5,000		
Direct sunlight	2 hr.				Fluorescent lamp (white)	
		4,000		4,000		
⇕	1 hr.		White			Auto white balance range
		3,500		3,500	Fluorescent lamp (off white) Studio lamp 	
	40 min.	3,200	⇕	3,200	Halogen lamp	
		3,000		3,000		Indoor mode
Time after sunrise/ before sunset			Yellow		Tungsten lamp	
		2,500		2,500		
	30 min.		⇕			
	20 min.					
			Red			
		2,000		2,000		
Sunrise/sunset			⇩		Candle light 	

C



Hints for Better Shooting

For More Effective Production

Scene length — not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6–7 seconds in length for easier viewing.
A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

Cut the scene when the narration is finished.

Cutting according to the subject C

- Make long shots longer **[a]** ...and close-ups shorter **[b]**.
  Because long shots have more to see in them than colse-ups, show them longer so the viewer may understand what's there.
- Make interesting shots and shots in which the subject is constantly moving longer. **[c]**
- Make static shots shorter **[d]**

Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

In video, organization is the key

To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events that happen around you, such as sports matches, graduations, birthday parties, picnics, camping trips, and other special events.

When the tape is edited after recording
Shoot the scene a little longer to make the editing easier.

When the tape is not edited after recording
First record a title and then use the START/STOP function to make a smooth recording.

Use of the Battery Pack

There are two kinds of batteries, non-rechargeable ones (primary batteries) such as manganese, alkaline or lithium batteries, and rechargeable ones (secondary batteries) such as nickel-cadmium or lead batteries.
The BP 8-1/8-2 battery pack used for this unit is a rechargeable type. When a rechargeable battery is used under proper conditions, the power capacity remains stable for a long period.

Battery Life

For every hour's worth of tape you shoot, plan to use 2 to 3 hour's worth of battery power.

The BP 8-1 provides approximately 40 minutes operation.
The BP 8-2 provides approximately 80 minutes operation.

The above battery life shows when the fully-charged battery is used for continuous recording in the normal temperature.
The following cases cause the battery to wear.

- In the recording pause mode (standby)
- When the auto focusing operates
- When the power zooming operates
- When the cassette is inserted or removed

Ambient temperature

If the battery pack is used in a cold environment, its operating time is shortened.
A chemical change occurs inside the battery when generating electrical energy. When the ambient temperature is high, the chemical change is stronger and the battery life is extended.

Charging and Discharging

To use the battery pack for a long time, charge the battery pack fully and discharge it.

Charging

- The battery pack can be charged within a temperature range of 0°C to 40°C (32°F to 104°F). However, it is hard to charge the battery pack in a cold place. We recommend undertaking charging operations within a temperature range of 10°C to 30°C (50°F to 86°F).
- The battery pack was not charged at the factory. So before using the battery pack, please charge it.
- Before using the battery which has not been used for a long time (about 1 year), charge the battery fully. In this case the battery life is shorten.
  After several charging and discharging operations, the battery life will recover its original status.
- The battery pack may be warm after use or after charging, but this is normal. This is due to the chemical change that has occurred inside the battery.

Discharging

- After using the recorder, remove the cassette and set the POWER switch to CAMERA and slide up the ⏻/LOCK switch, and leave the recorder until the battery pack is fully discharged.
- If recharging is repeated before the battery is exhausted, the battery life will be shortened.
  If the battery life has been shortened due to this, charge and discharge it to recover the original battery capacity.
- Please use the battery pack until the 🪫 mark blinks.
- To discharge, the battery pack as completely as possible, use an optional video light.
  If the video light becomes dark, remove it from the video camera recorder.

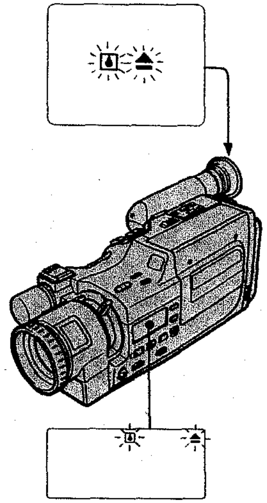
Storage

- When the video camera recorder is not in use, discharge the battery pack completely, remove and store it in a cold place. When the battery pack is installed, even if the power is turned off, a very small amount of electric current flows.
- Even when the battery pack is not in use, it discharges. This is called self-discharge. Self-discharge of the nickel-cadmium battery is more than that of the manganese or alkaline battery.
  The capacity decreases about 20% in one month and 30% in two months.
  After the battery is stored in a hot place, the capacity is lowered due to self-discharge.

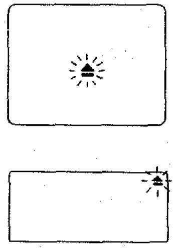
Battery life
The battery pack can be used about 500 times in normal temperature, if it is charged fully and discharged and stored in a cold place when not in use.

The battery pack can be used until the capacity becomes less than 50% and cannot be recharged.
Even when a fully charged battery is used, if the 🪫 mark blinks, use a new battery pack.

D-1



D-2



Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: D-1

The 💧 and ⏏ indication blinks inside the viewfinder or in the display window.
No function except for cassette ejection will work.

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

The unit can be used again if the 💧 and ⏏ indication does not appear when the power is turned on again.

If moisture is present on the surface of the tape D-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indication blinks inside the viewfinder or in the display window. No function except for cassette ejection will work.

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indication does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indications, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

Precautions

Operation

- Operate the unit on 6.0V (using battery pack) or 7.5V (using AC power adaptor) DC.
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light sources) as this will damage the color filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  - — Locations susceptible to vibration.
  - — Locations exposed to strong magnetic fields.
  - — Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
  For protection, keep the lens cap on the lens when not using the camera.

Using Your Recorder Abroad

Each country has special TV colour broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in colour systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V–240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the PAL system and have the video/audio inputs.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Phillipines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Luxemburg, Monaco, Poland, the Soviet Union, etc.

Cassettes and Their Recording Time

There are two formats for 8 mm video recording, PAL and NTSC. Video cassette tapes are made to correspond to the respective formats. Use PAL format cassette tape for the VS 8000. You will find "P5" on the package of the cassette. In some countries, however, only NTSC format cassette tape with "P6" on the package is available. In this case, the standard recording times stipulated on the cassette are different from the actual recording time.
For your reference, the recording times PAL and NTSC format cassettes are as follows:

PAL cassette			NTSC cassette		
	Recording time			Recording time	
Cassette	SP mode	LP mode	Cassette	SP mode	LP mode
P5-15	15 min.	30 min.	P6-15	10 min.	20 min.
P5-30	30 min.	60 min.	P6-30	21 min.	42 min.
P5-60	60 min.	120 min.	P6-60	42 min.	84 min.
P5-90	90 min.	180 min.	P6-90	64 min.	128 min.
			P6-120	85 min.	170 min.

Specifications

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Playback time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Fast forward time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5–68 mm, F1.4 with macro Filter diameter: 46 mm
Auto focus system	Infrared autofocus
Colour temperature	Auto: From the light at a tungsten lamp to the light on a slightly overcast day. Preset value ☀ (5800K) ☼ (3200K)
Minimum illumination	3 lux
Illumination range	3 lux – 100,000 lux (0.3 – 9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, –7.5dBs, at output impedance less than 2.2 kilohms
RFU adaptor DC output	Special minijack, 5V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance With 2.5–3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY, ■, ☀/☼, ▨, ZERO MEM, FADER, SP/LP
Caution: ▭, ▣, ▢, ⏏, ⊗
Time/date indication
Shutter speed indication
Tape counter
Recording/battery lamp

General

Power requirements	6.0V (using battery pack)/ 7.5V (using AC power adaptor) DC
Power consumption	6.5 W (camera recording) including the viewfinder
Installation	Vertically
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 114 × 131 × 315 mm (w/h/d) ($4\frac{1}{2} \times 5\frac{1}{4} \times 12\frac{1}{2}$ in.)
Weight	Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, omni-directional monaural type

Optional accessories

Battery pack BP 8-1, BP 8-2
DC pack

Design and specifications are subject to change without notice.

Your dealer may not handle some of the above listed optional accessories. Please ask the dealer for detailed information about the optional accessories available in your country.

Note
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

Troubleshooting

If you think you have a problem, double-check before calling the serviceman.
You may have overlooked something relatively simple!

Symptom	Cause (Trouble indicator)	Procedure
The power does not turn on.	The battery is not attached.	Attach the battery.
	The battery is exhausted.	Use a new battery.
	The AC power adaptor is not connected to a wall outlet.	Connect the adaptor to a wall outlet.
The START/STOP button does not operate.	The tape is affixed to the drum.	Remove the cassette with the ▮▶ button.
	The tape is at its end.	Rewind the tape or use a new one.
	The POWER switch is set to VIDEO.	Set it to CAMERA.
	The tab on the cassette is out (red).	Use a new cassette or slide the tab.
The tape does not move when a tape transport button is pressed.	POWER switch is set to CAMERA or OFF.	Set it to VIDEO.
	The tape is at its end.	Rewind the tape or use a new one.
The power turns off.	While being operated in the CAMERA mode, the recorder has been in the pause mode for more than 5 minutes.	Slide down the ⏻/LOCK switch, and slide it up again.
	The battery is exhausted.	Use a charged battery.
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high; the camera is not malfunctioning.	–
The battery pack is quickly discharged.	The ambient temperature is too low.	–
	The battery pack has not been charged fully.	Charge the battery pack again.
The cassette cannot be removed from the compartment.	The battery is exhausted.	Use the charged battery or the AC power adaptor
The auto focusing function does not work.	The focusing is set to manual.	Set the auto focusing.
	Shooting conditions are not suitable for auto focusing operation.	Focus manually.
The colour of the playback is not appropriate.	The white balance sensor is covered.	Clear the sensor.
	Shooting conditions care not suitable for auto white balance operation.	Adjust the white balance manually.
The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.
The playback picture is not clear.	The REC MODE/EDIT switch is set to the "EDIT" position.	Set the REC MODE/EDIT switch to the upper position.
	The programme position for the VTR is not adjusted on the TV.	Adjust the TV.

Troubleshooting

Symptom	Cause (Trouble indicator)	Procedure
The playback picture is too bright.	The BLC button was not released during recording.	–
The picture is noisy.	The video heads may be contaminated.	Clean the heads using a video head cleaning cassette. For details on cleaning, refer to the instructions furnished with the cleaning cassette. If a cleaning cassette is not available in your area, have the heads cleaned at the nearest Grundig service facility.
No function except for cassette ejection works.	Moisture condensation has occurred.	Remove the cassette and leave the unit for at least an hour.
The counter or date/time indication in the display window blinks	The lithium battery is not installed.	Install the lithium battery.
	The lithium battery is exhausted.	Use a new battery

Trouble Indications

○ when the indicator appears ☐ Lighting ☐ slow blinking ▨ fast blinking

	Position of the POWER switch		Indication		
Cause	VIDEO	CAMERA	Indicator to be shown inside the viewfinder	Camera recording/ battery lamp	Indication to be shown in the display window
The battery is fully exhausted.	○	○	▨ 🪫	▨	▨ 🪫
The battery is weak.	○	○	🪫		🪫
The tape is at its end.		○	▨ 📼 ⏏		▨ 📼 ⏏
No cassette is inserted.		○	📼		📼
The tab on the cassette is out.		○	📼 ⏏		📼 ⏏
Moisture has condensed inside the unit.	○	○	▨ 💧 ⏏		▨ 💧 ⏏
The gap of the head is clogged.	○	○	⊗		⊗
Other troubles	○	○	▨ ⏏		▨ ⏏
The lithium battery is weak	○ (The indication inside the viewfinder does not appear.)	○	The counter or date/time (5 seconds)		Date or Time

S 35

Check List Before Recording

To make sure you don't miss those "once in a lifetime" scenes, go over the following check list and make the necessary preparations.

Required for recording

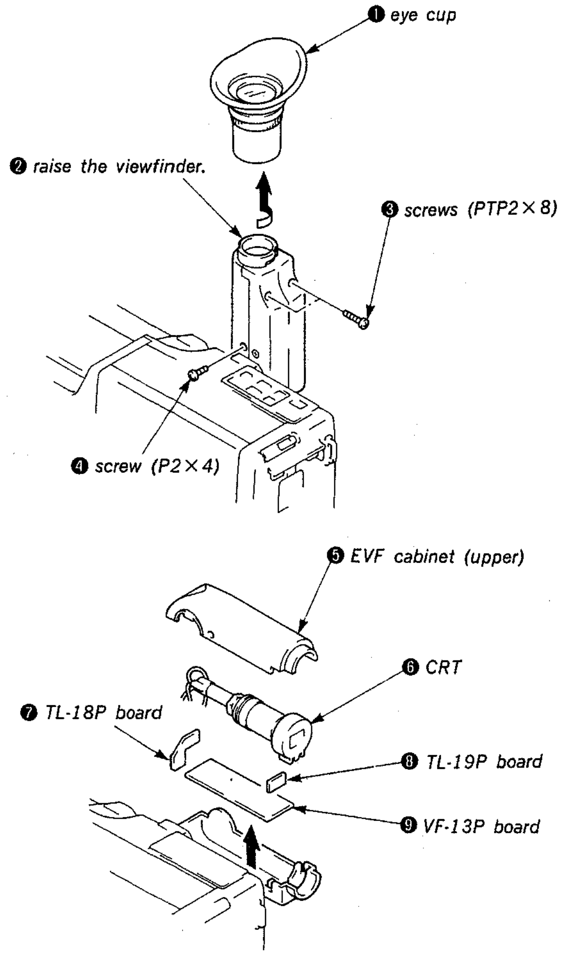
VS 8000	
Battery pack BP 8-1 or BP 8-2	Is it charged? Are there enough battery packs to cover the planned recording time?
Casssette tapes	Have you prepared enough tapes to cover the planned recording time?

Convenient accessories

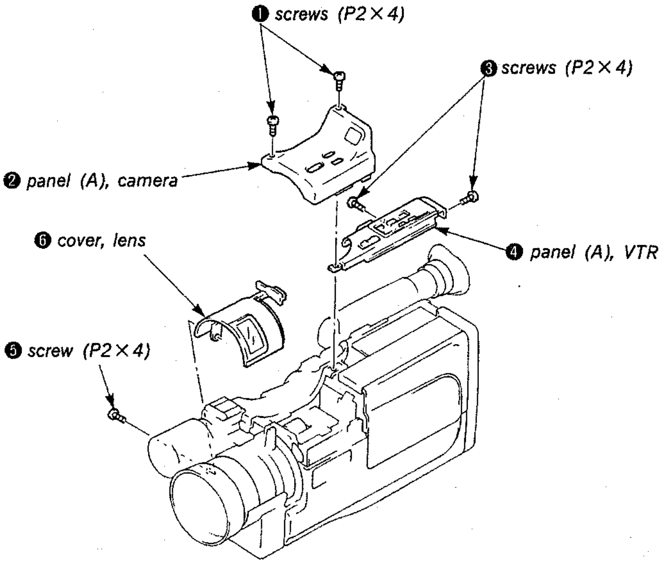
Carrying case	
Tripod	Required for scenes in which stability of the camera is important. Tripod mount screw must match the receptacle mount.
AC power adaptor	Used to operate the video camera recorder on house current and to charge battery packs
Video light	Required for recording in low light situations.
Earphone (miniplug)	Permits monitoring of audio signal during recording.

SECTION 2
DISASSEMBLY

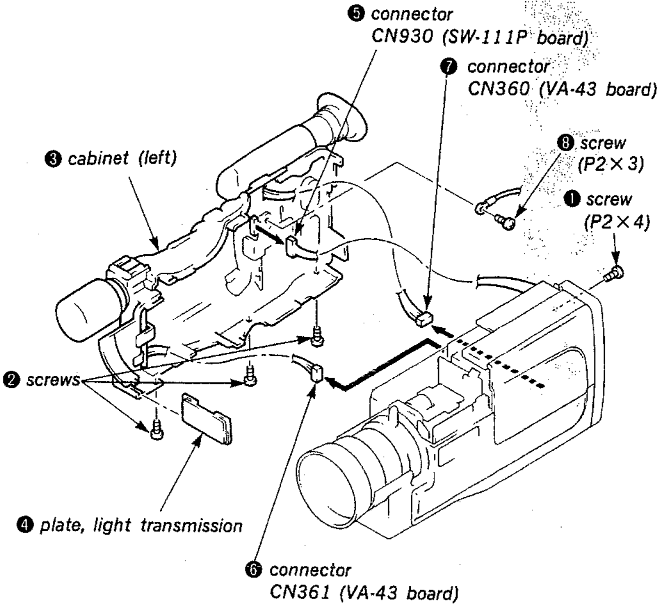
2-1. REMOVAL OF VIEWFINDER


❶ eye cup
❷ raise the viewfinder.
❸ screws (PTP2×8)
❹ screw (P2×4)
❺ EVF cabinet (upper)
❻ CRT
❼ TL-18P board
❽ TL-19P board
❾ VF-13P board

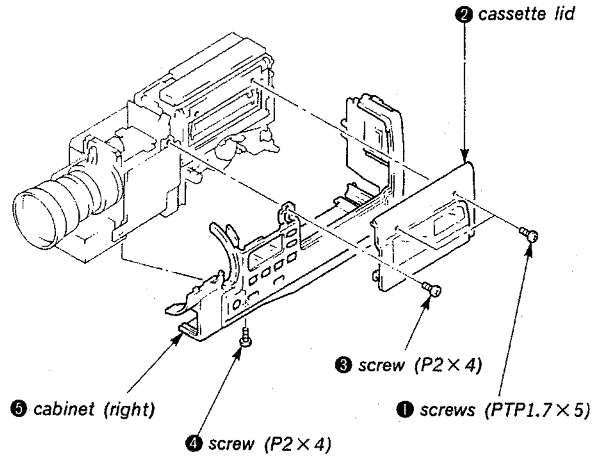
2-2. REMOVAL OF CABINET (1)


❶ screws (P2×4)
❸ screws (P2×4)
❷ panel (A), camera
❹ panel (A), VTR
❻ cover, lens
❺ screw (P2×4)

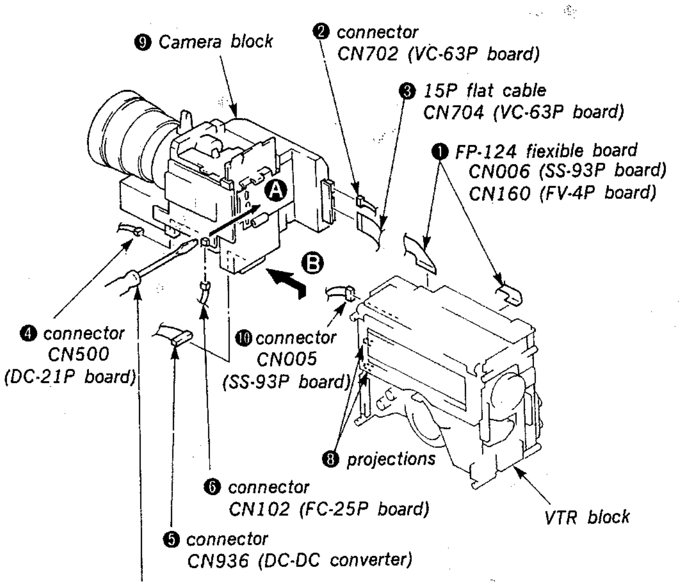
2-3. REMOVAL OF CABINET (2)
— CABINET (LEFT) —


❺ connector
CN930 (SW-111P board)
❼ connector
CN360 (VA-43 board)
❸ cabinet (left)
❽ screw
(P2×3)
❶ screw
(P2×4)
❷ screws
❹ plate, light transmission
❻ connector
CN361 (VA-43 board)

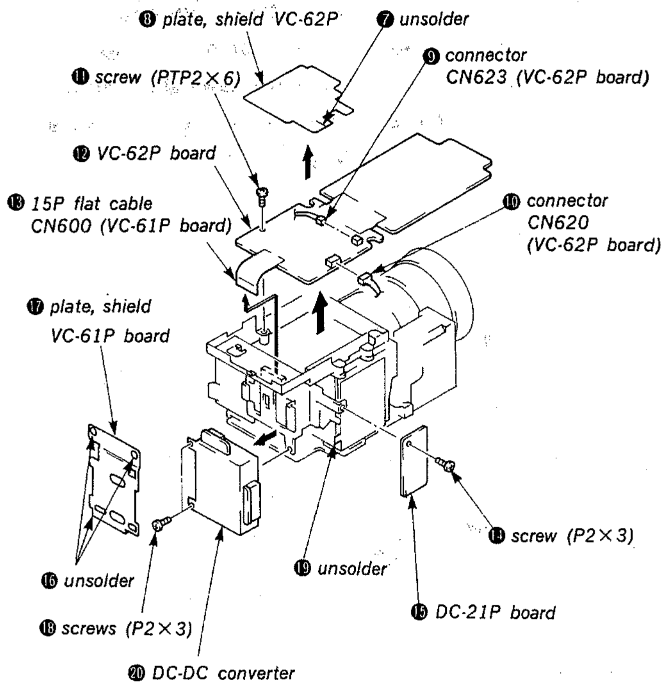
2-4. REMOVAL OF CABINET (3)
— CABINET (RIGHT) —


❷ cassette lid
❸ screw (P2×4)
❺ cabinet (right)
❶ screws (PTP1.7×5)
❹ screw (P2×4)

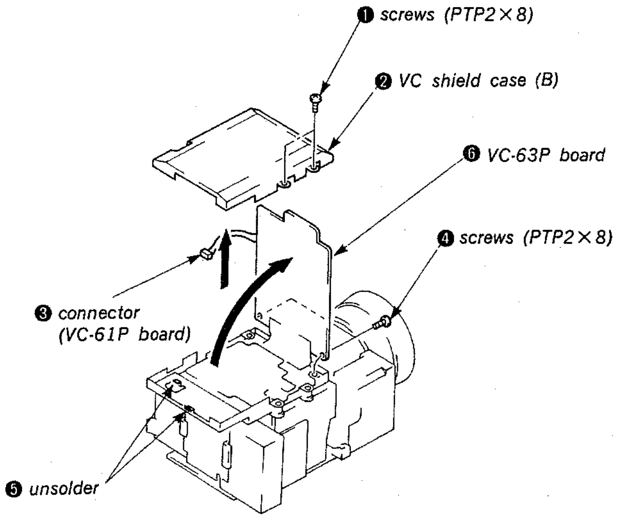
2-5. SEPARATING THE CAMERA AND VTR BLOCKS

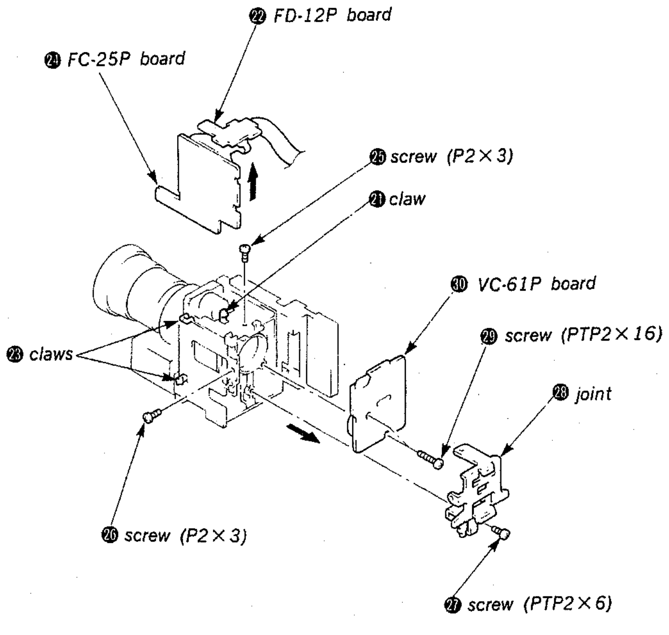

⑨ Camera block
② connector CN702 (VC-63P board)
③ 15P flat cable CN704 (VC-63P board)
① FP-124 flexible board CN006 (SS-93P board) CN160 (FV-4P board)
A
B
④ connector CN500 (DC-21P board)
⑩ connector CN005 (SS-93P board)
⑧ projections
⑥ connector CN102 (FC-25P board)
VTR block
⑤ connector CN936 (DC-DC converter)

⑦ Insert a flat-bladed screwdriver between the camera block and VTR block (as shown by arrow Ⓐ) to separate two projections. Then slightly lift and remove the camera block ⑨ in the direction shown by the arrow Ⓑ.


⑧ plate, shield VC-62P
⑦ unsolder
⑪ screw (PTP2×6)
⑨ connector CN623 (VC-62P board)
⑫ VC-62P board
⑬ 15P flat cable CN600 (VC-61P board)
⑩ connector CN620 (VC-62P board)
⑰ plate, shield VC-61P board
⑭ screw (P2×3)
⑯ unsolder
⑲ unsolder
⑮ DC-21P board
⑱ screws (P2×3)
⑳ DC-DC converter

2-6. REMOVAL OF VC-61P (CCD IMAGER), VC-62P AND VC-63P BOARDS

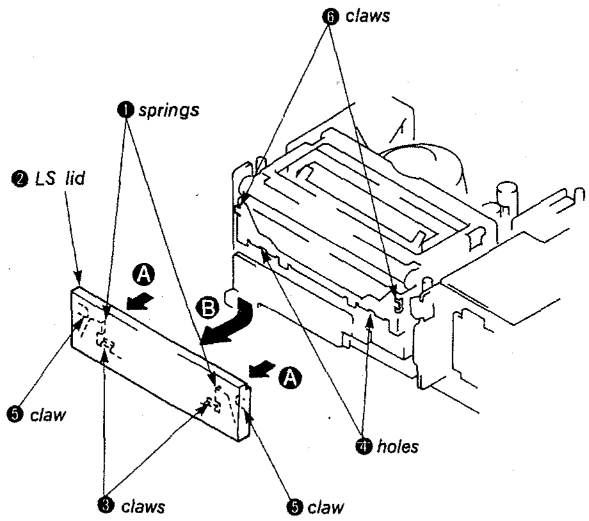

① screws (PTP2×8)
② VC shield case (B)
⑥ VC-63P board
④ screws (PTP2×8)
③ connector (VC-61P board)
⑤ unsolder


㉒ FD-12P board
㉔ FC-25P board
㉕ screw (P2×3)
㉑ claw
㉚ VC-61P board
㉙ screw (PTP2×16)
㉓ claws
㉘ joint
㉖ screw (P2×3)
㉗ screw (PTP2×6)

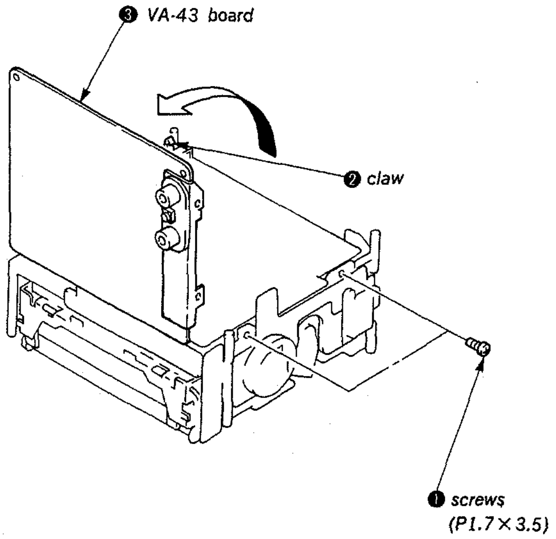
2-7. REMOVAL OF LS LID

1) Insert a thin flat -bladed screwdriver into the spring ❶ at 2 points and push it in the direction of arrow Ⓐ, and then remove the LS lid ❷ in the direction of arrow Ⓑ.

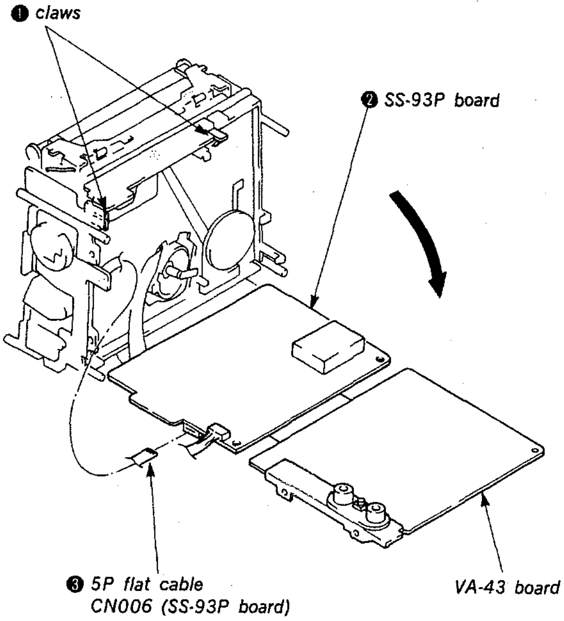
Note : To re-assemble, locate the two claws ❸ at the back of each hole ❹ at 2 points, and also the two claws ❺ at the back of each claw ❻ at 2 locations.


❻ claws
❶ springs
❷ LS lid
Ⓐ
Ⓑ
Ⓐ
❺ claw
❹ holes
❸ claws
❺ claw

2-8. OPENING THE VA-43 BOARD

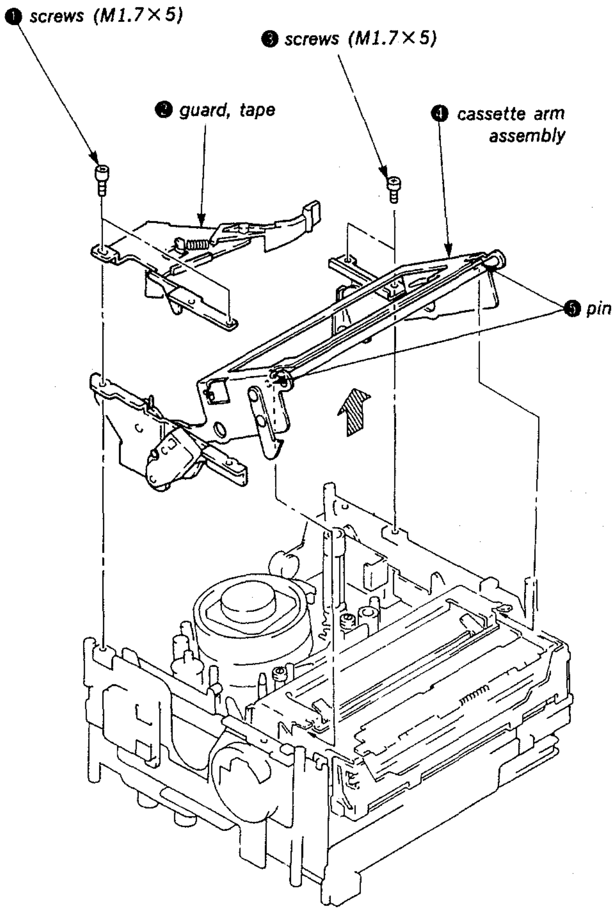

❸ VA-43 board
❷ claw
❶ screws
(P1.7×3.5)

2-9. OPENING THE SS-93P BOARD

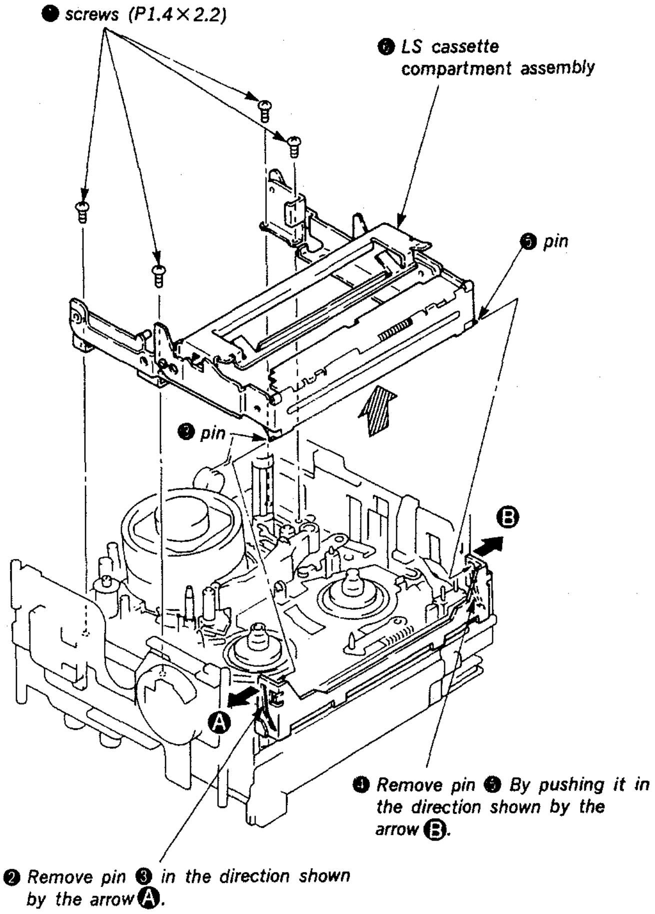

❶ claws
❷ SS-93P board
❸ 5P flat cable
CN006 (SS-93P board)
VA-43 board

2-10. REMOVAL OF CASSETTE ARM ASSEMBLY

Note :
To re- assembly the cassette arm assembly ❹, adjust it so that pin ❺ can be inserted in the correct position.

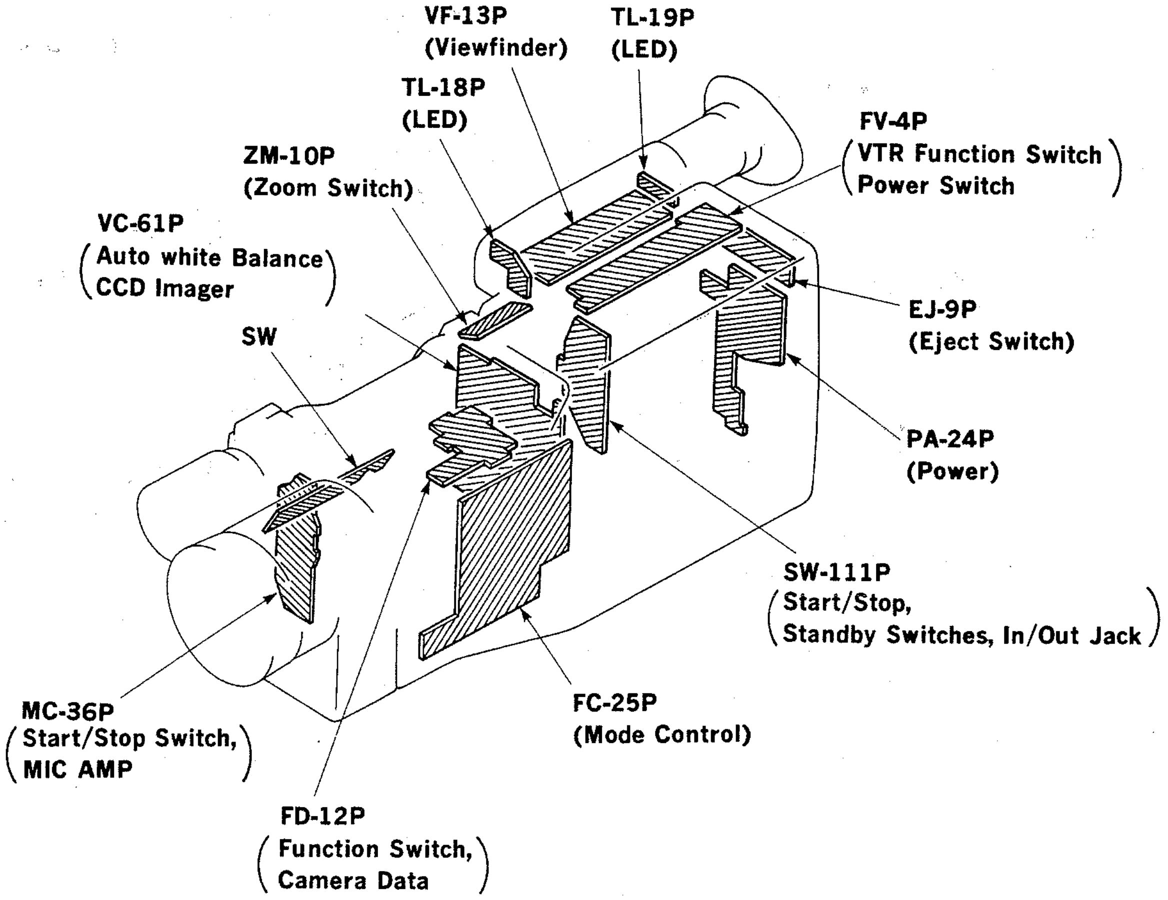

❶ screws (M1.7×5)
❸ screws (M1.7×5)
❷ guard, tape
❹ cassette arm assembly
❺ pin

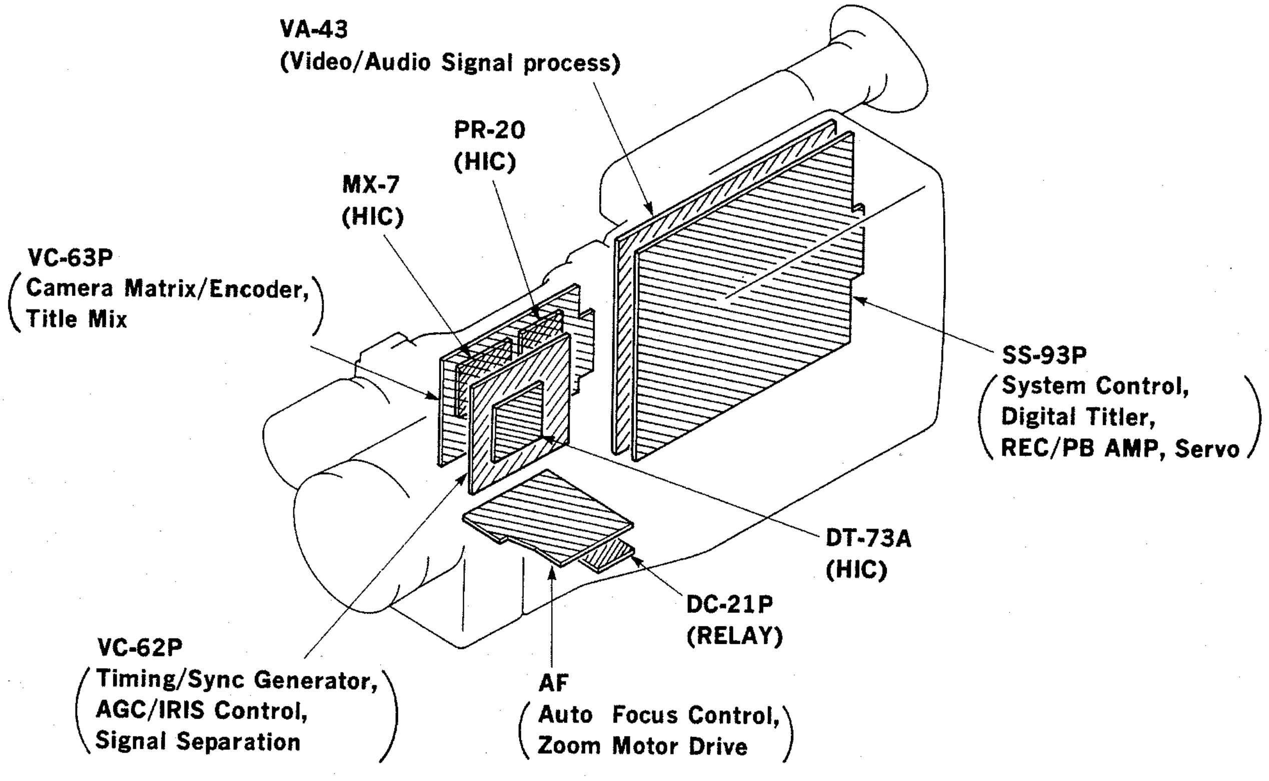
2-11. REMOVAL OF LS CASSETTE COMPARTMENT ASSEMBLY


❶ screws (P1.4×2.2)
❻ LS cassette compartment assembly
❺ pin
❸ pin
Ⓑ
Ⓐ
❹ Remove pin ❺ By pushing it in the direction shown by the arrow Ⓑ.
❷ Remove pin ❸ in the direction shown by the arrow Ⓐ.

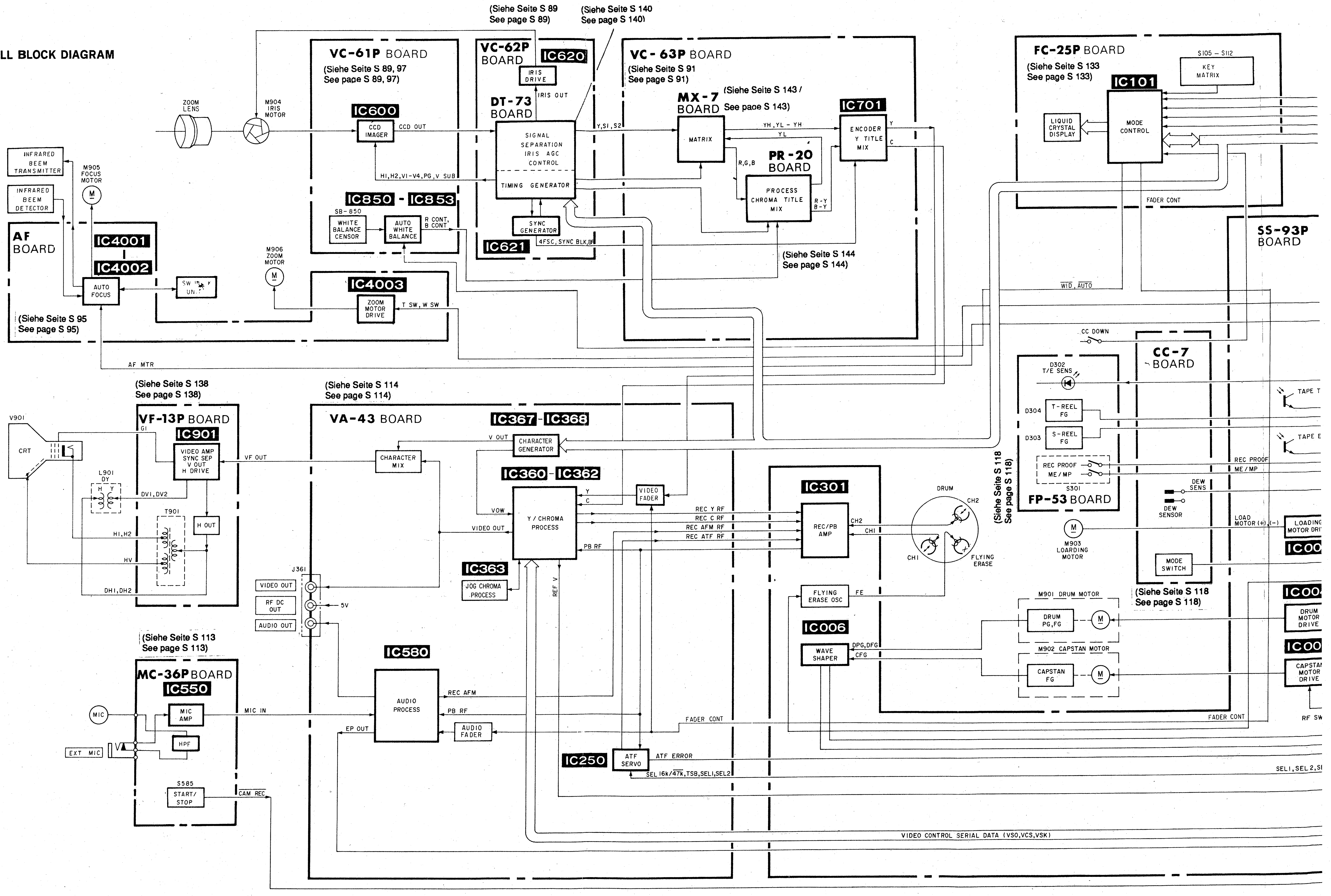
SECTION 3
DIAGRAMS

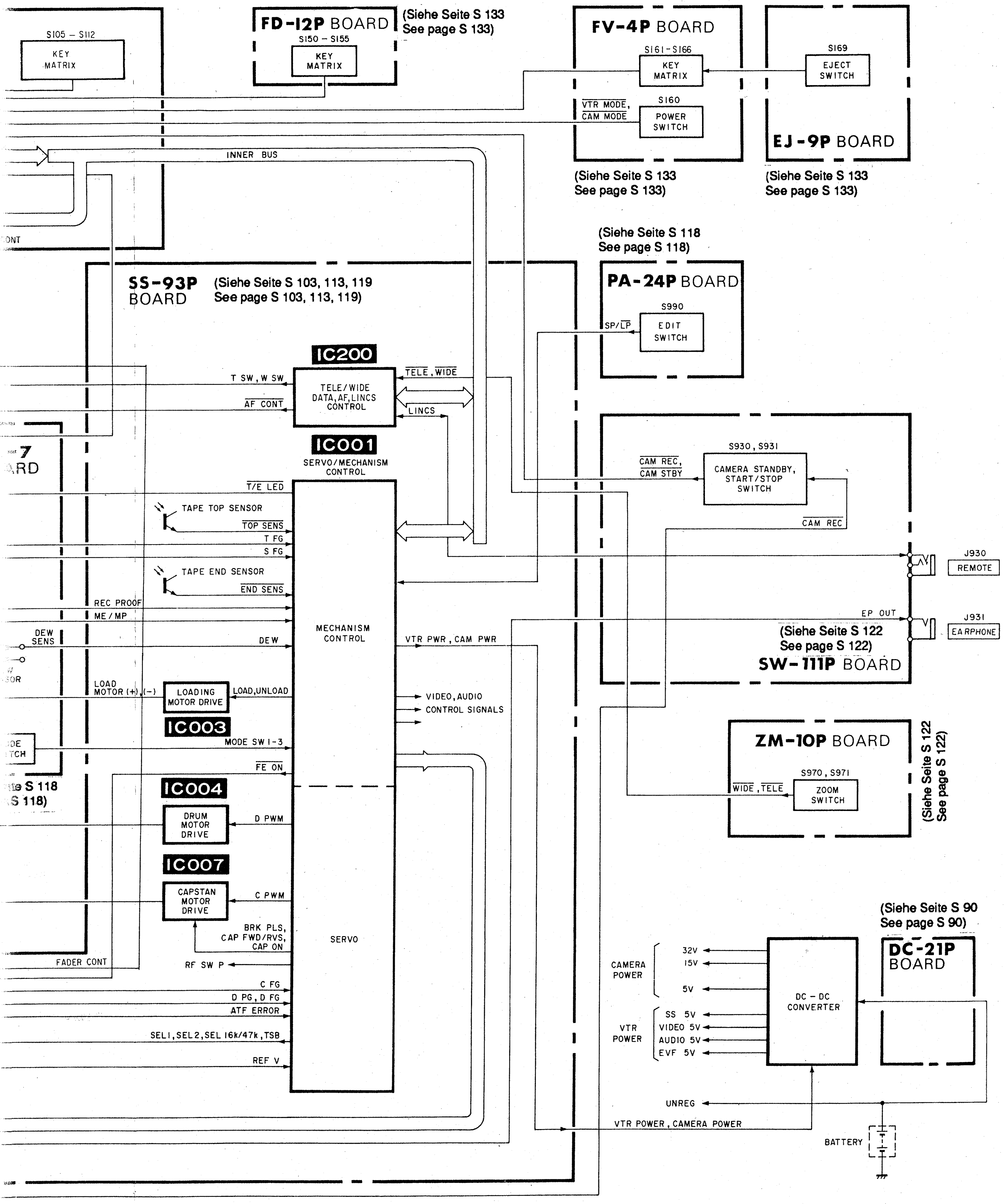
3-1. CIRCUIT BOARDS LOCATION


VF-13P
(Viewfinder)
TL-19P
(LED)
TL-18P
(LED)
FV-4P
(VTR Function Switch
Power Switch)
ZM-10P
(Zoom Switch)
VC-61P
(Auto white Balance
CCD Imager)
SW
EJ-9P
(Eject Switch)
PA-24P
(Power)
SW-111P
(Start/Stop,
Standby Switches, In/Out Jack)
MC-36P
(Start/Stop Switch,
MIC AMP)
FC-25P
(Mode Control)
FD-12P
(Function Switch,
Camera Data)

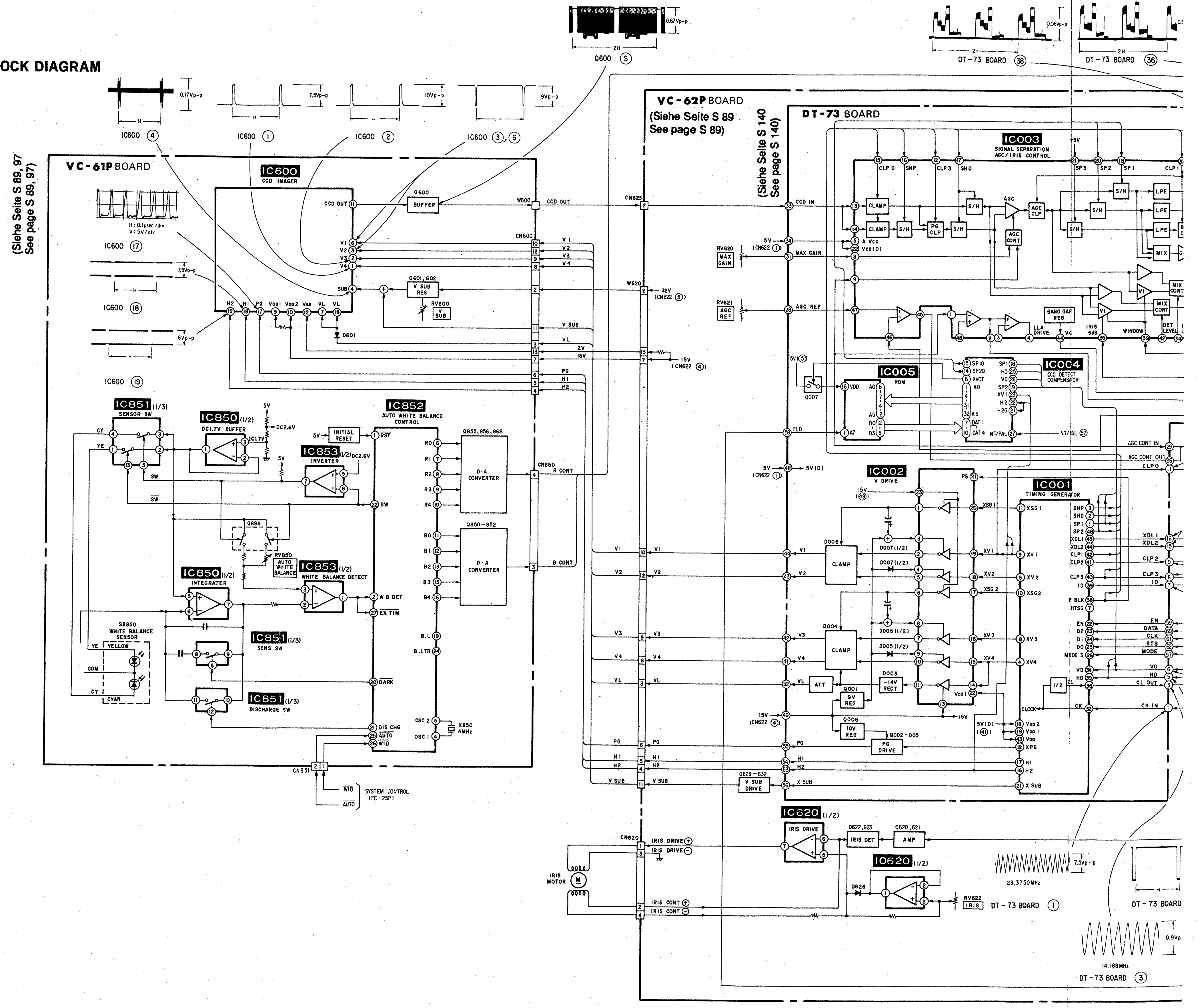

VA-43
(Video/Audio Signal process)
PR-20
(HIC)
MX-7
(HIC)
VC-63P
(Camera Matrix/Encoder,
Title Mix)
SS-93P
(System Control,
Digital Titler,
REC/PB AMP, Servo)
DT-73A
(HIC)
DC-21P
(RELAY)
VC-62P
(Timing/Sync Generator,
AGC/IRIS Control,
Signal Separation)
AF
(Auto Focus Control,
Zoom Motor Drive)

3-2. OVERALL BLOCK DIAGRAM

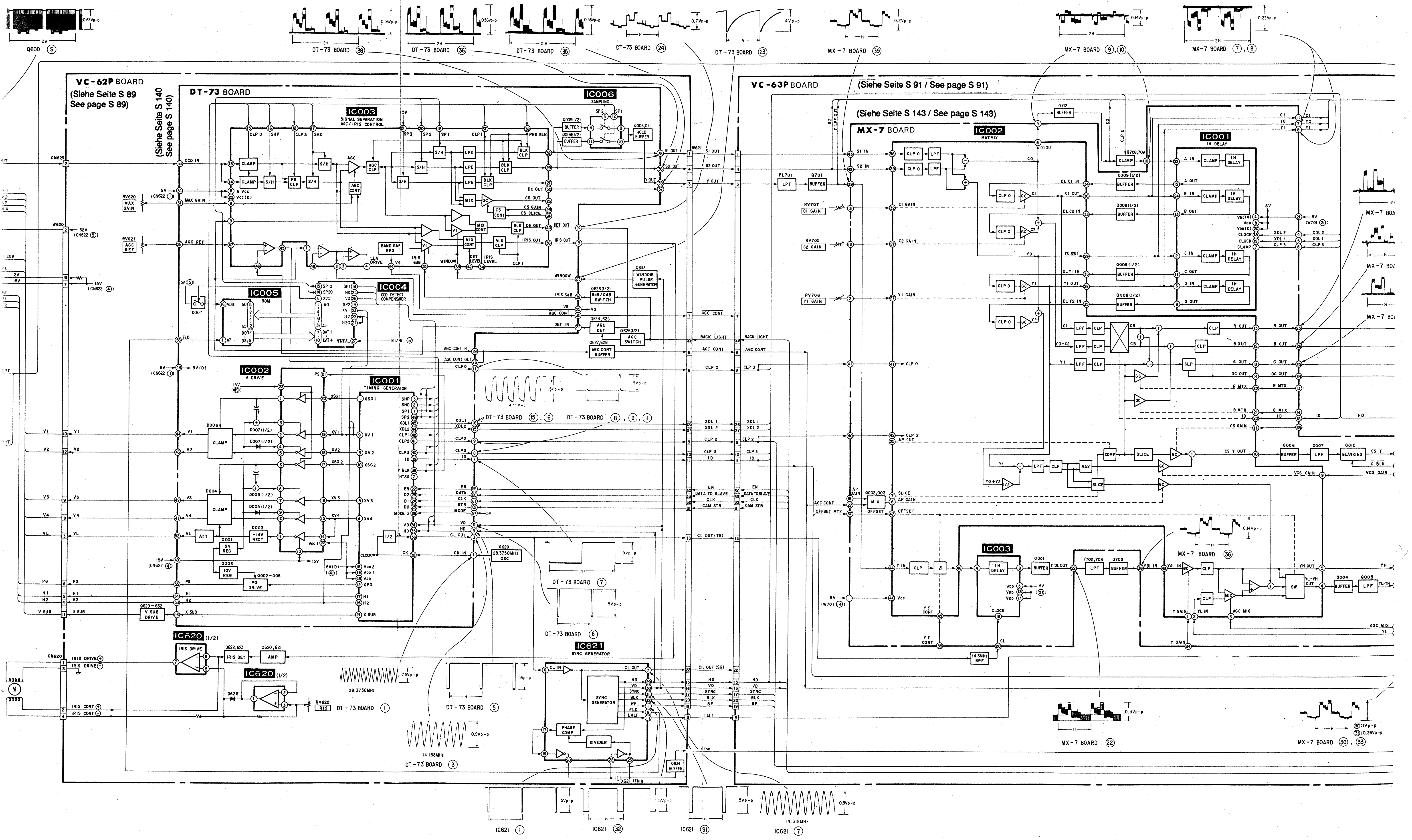

(Siehe Seite S 89
See page S 89)
(Siehe Seite S 140
See page S 140)
VC-61P BOARD
(Siehe Seite S 89, 97
See page S 89, 97)
VC-62P BOARD
IC620
IRIS DRIVE
IRIS OUT
DT-73 BOARD
VC-63P BOARD
(Siehe Seite S 91
See page S 91)
MX-7 BOARD
(Siehe Seite S 143 /
See page S 143)
IC701
FC-25P BOARD
(Siehe Seite S 133
See page S 133)
S105 – S112
KEY MATRIX
IC101
LIQUID CRYSTAL DISPLAY
MODE CONTROL
FADER CONT
ZOOM LENS
M904 IRIS MOTOR
IC600
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
Y,S1,S2
MATRIX
YH,YL – YH
YL
R,G,B
PR-20 BOARD
ENCODER Y TITLE MIX
Y
C
PROCESS CHROMA TITLE MIX
R-Y
B-Y
INFRARED BEEM TRANSMITTER
INFRARED BEEM DETECTOR
M905 FOCUS MOTOR
M
H1,H2,V1-V4,PG,V SUB
IC850 - IC853
SB-850
WHITE BALANCE CENSOR
AUTO WHITE BALANCE
R CONT,
B CONT
SYNC GENERATOR
IC621
4FSC,SYNC BLK,BF
(Siehe Seite S 144
See page S 144)
AF BOARD
IC4001
IC4002
AUTO FOCUS
SW IN K UNIT
M906 ZOOM MOTOR
M
IC4003
ZOOM MOTOR DRIVE
T SW, W SW
(Siehe Seite S 95
See page S 95)
AF MTR
WID, AUTO
SS-93P BOARD
CC DOWN
CC-7 BOARD
D302 T/E SENS
D304
T-REEL FG
D303
S-REEL FG
REC PROOF
ME/MP
S301
FP-53 BOARD
(Siehe Seite S 118
See page S 118)
TAPE T
TAPE E
REC PROOF
ME/MP
DEW SENS
DEW SENSOR
LOAD MOTOR (+), (–)
LOADING MOTOR DRI
IC00
M
M903 LOADING MOTOR
MODE SWITCH
(Siehe Seite S 118
See page S 118)
(Siehe Seite S 138
See page S 138)
VF-13P BOARD
IC901
V901
CRT
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
H Y
DV1,DV2
T901
H OUT
H1,H2
HV
DH1,DH2
(Siehe Seite S 114
See page S 114)
VA-43 BOARD
IC367 - IC368
V OUT
CHARACTER GENERATOR
CHARACTER MIX
IC360 - IC362
Y
C
VIDEO FADER
VOW
Y / CHROMA PROCESS
VIDEO OUT
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
PB RF
IC301
REC/PB AMP
CH2
CH1
DRUM
CH2
CH1
FLYING ERASE
IC363
JOG CHROMA PROCESS
REF V
J361
VIDEO OUT
RF DC OUT
AUDIO OUT
5V
FLYING ERASE OSC
FE
IC006
WAVE SHAPER
DPG,DFG
CFG
M901 DRUM MOTOR
DRUM PG,FG
M
M902 CAPSTAN MOTOR
CAPSTAN FG
M
IC00
DRUM MOTOR DRIVE
IC00
CAPSTAN MOTOR DRIVE
RF SW
(Siehe Seite S 113
See page S 113)
MC-36P BOARD
IC550
MIC
MIC AMP
MIC IN
HPF
EXT MIC
IC580
AUDIO PROCESS
REC AFM
PB RF
EP OUT
AUDIO FADER
FADER CONT
FADER CONT
IC250
ATF SERVO
ATF ERROR
SEL 16k/47k,TSB,SEL1,SEL2
SEL1,SEL2,SE
S585
START/STOP
CAM REC
VIDEO CONTROL SERIAL DATA (VSO,VCS,VSK)

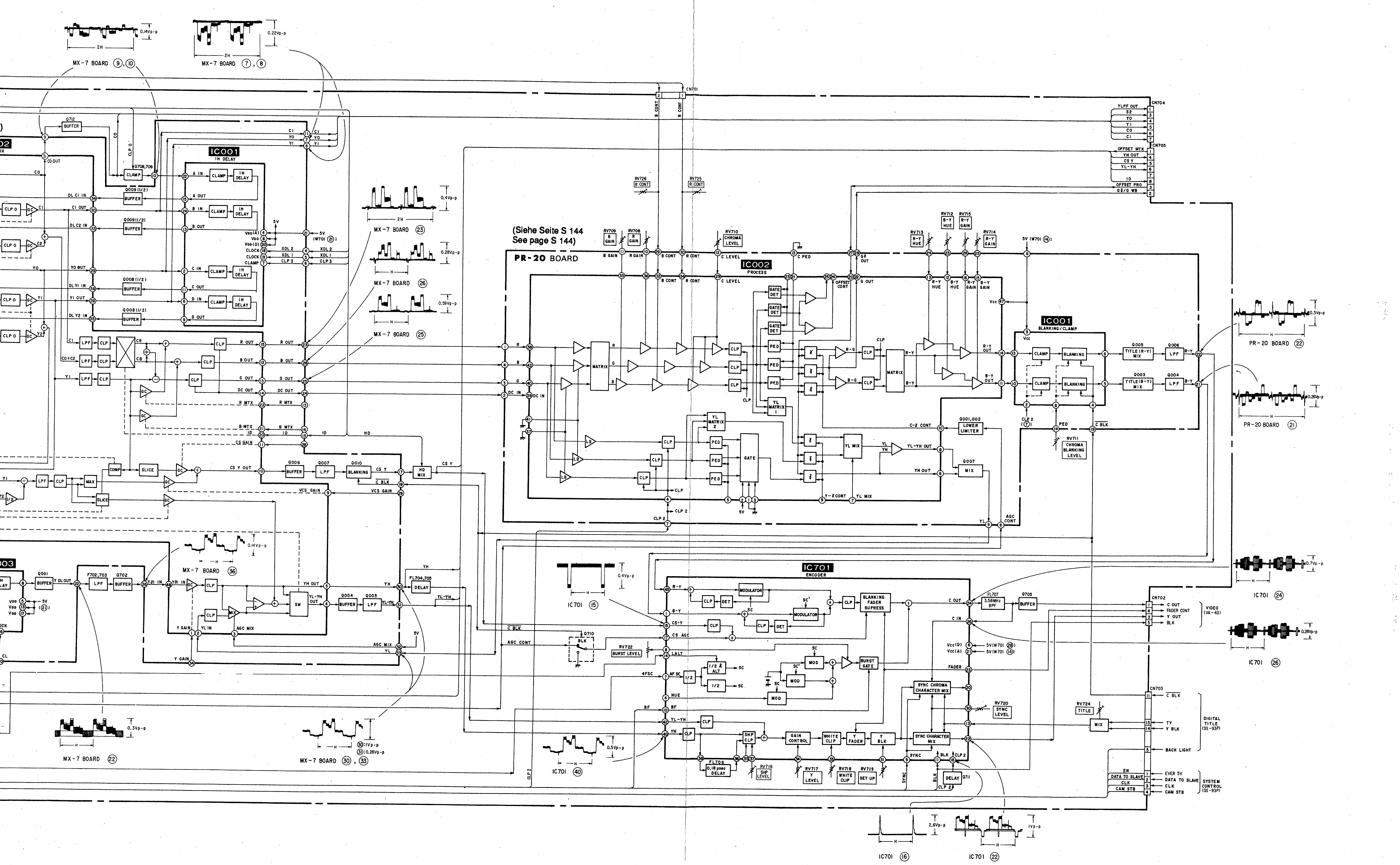

S105 – S112
KEY MATRIX
FD-12P BOARD
S150 – S155
KEY MATRIX
(Siehe Seite S 133
See page S 133)
FV-4P BOARD
S161 – S166
KEY MATRIX
S160
VTR MODE, CAM MODE
POWER SWITCH
(Siehe Seite S 133
See page S 133)
S169
EJECT SWITCH
EJ-9P BOARD
(Siehe Seite S 133
See page S 133)
INNER BUS
ONT
SS-93P BOARD
(Siehe Seite S 103, 113, 119
See page S 103, 113, 119)
(Siehe Seite S 118
See page S 118)
PA-24P BOARD
S990
SP/LP
EDIT SWITCH
IC200
T SW, W SW
TELE/WIDE DATA, AF, LINCS CONTROL
AF CONT
TELE, WIDE
LINCS
IC001
SERVO/MECHANISM CONTROL
7
RD
T/E LED
TAPE TOP SENSOR
TOP SENS
T FG
S FG
TAPE END SENSOR
END SENS
REC PROOF
ME / MP
DEW SENS
DEW
MECHANISM CONTROL
VTR PWR, CAM PWR
OR
LOAD MOTOR (+), (−)
LOADING MOTOR DRIVE
LOAD, UNLOAD
IC003
VIDEO, AUDIO
CONTROL SIGNALS
DE
TCH
MODE SW 1-3
FE ON
te S 118
S 118)
IC004
DRUM MOTOR DRIVE
D PWM
IC007
CAPSTAN MOTOR DRIVE
C PWM
BRK PLS, CAP FWD/RVS, CAP ON
SERVO
FADER CONT
RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2, SEL 16k/47k, TSB
REF V
S930, S931
CAM REC, CAM STBY
CAMERA STANDBY, START/STOP SWITCH
CAM REC
J930
REMOTE
EP OUT
J931
EARPHONE
(Siehe Seite S 122
See page S 122)
SW-111P BOARD
ZM-10P BOARD
S970, S971
WIDE, TELE
ZOOM SWITCH
(Siehe Seite S 122
See page S 122)
(Siehe Seite S 90
See page S 90)
CAMERA POWER
32V
15V
5V
DC – DC CONVERTER
DC-21P BOARD
VTR POWER
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
UNREG
VTR POWER, CAMERA POWER
BATTERY

3-3. CAMERA BLOCK DIAGRAM

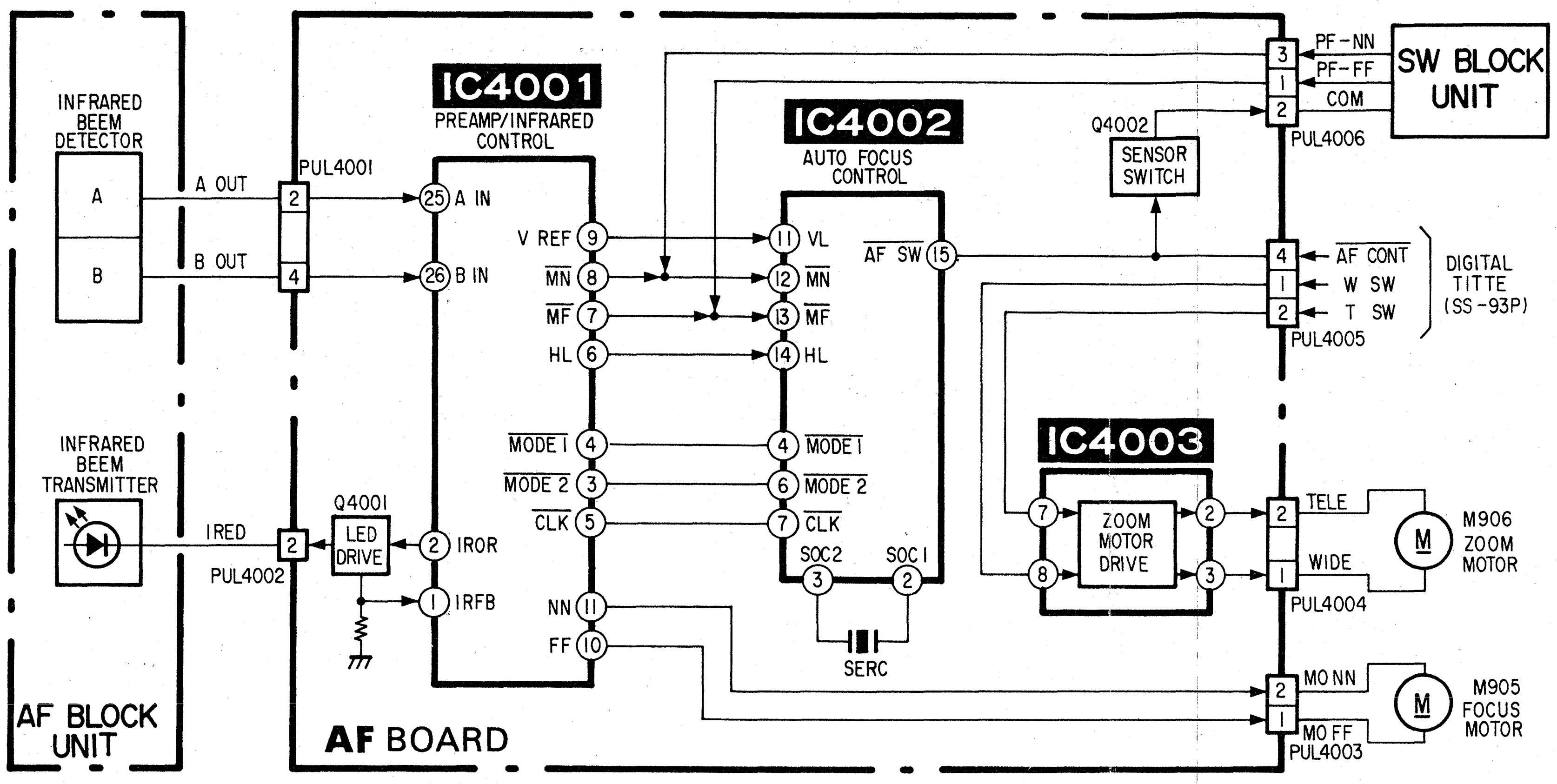


VC-61P BOARD
(Siehe Seite S 89, 97
See page S 89, 97)
IC600 CCD IMAGER
Q600 BUFFER
Q601, 602 V SUB REG
RV600 V SUB
IC851 (1/3) SENSOR SW
IC850 (1/2) DC1.7V BUFFER
IC853 (1/2) INVERTER
IC852 AUTO WHITE BALANCE CONTROL
INITIAL RESET
Q855, 856, 868
Q850 - 852
D·A CONVERTER
Q896
RV850 AUTO WHITE BALANCE
IC853 (1/2) WHITE BALANCE DETECT
IC850 (1/2) INTEGRATER
SB850 WHITE BALANCE SENSOR
YELLOW
CYAN
IC851 (1/3) SENS SW
IC851 (1/3) DISCHARGE SW
X850 4MHz
CN851
SYSTEM CONTROL (FC-25P)
IC600 ④
IC600 ①
IC600 ②
IC600 ③, ⑥
IC600 ⑰
IC600 ⑱
IC600 ⑲
H: 0.1μsec/div
V: 5V/div
0.17Vp-p
7.5Vp-p
10Vp-p
9Vp-p
6Vp-p
0.67Vp-p
Q600 Ⓢ
VC-62P BOARD
(Siehe Seite S 89
See page S 89)
DT-73 BOARD
(Siehe Seite S 140
See page S 140)
IC003 SIGNAL SEPARATION AGC/IRIS CONTROL
IC005 ROM
IC004 CCD DETECT COMPENSATOR
IC002 V DRIVE
IC001 TIMING GENERATOR
Q007
Q001 9V REG
Q006 10V REG
Q002 - 005 PG DRIVE
D003 -14V RECT
Q629 - 632 V SUB DRIVE
RV620 MAX GAIN
RV621 AGC REF
BAND GAP REG
IC620 (1/2) IRIS DRIVE
Q622, 623 IRIS DET
Q620, 621 AMP
IC620 (1/2)
RV622 IRIS
IRIS MOTOR
28.3750MHz
14.188MHz
DT-73 BOARD ①
DT-73 BOARD ③
DT-73 BOARD ㊳
DT-73 BOARD ㊱


Q600 ⑤
0.67Vp-p
2H
DT-73 BOARD ㊳
DT-73 BOARD ㊱
DT-73 BOARD ㉟
DT-73 BOARD ㉔
DT-73 BOARD ㉓
MX-7 BOARD ㊴
MX-7 BOARD ⑨, ⑩
MX-7 BOARD ⑦, ⑧
VC-62P BOARD
(Siehe Seite S 89
See page S 89)
(Siehe Seite S 140
See page S 140)
DT-73 BOARD
IC003
SIGNAL SEPARATION AGC / IRIS CONTROL
IC006
SAMPLING
IC005
ROM
IC004
CCD DETECT COMPENSATOR
IC002
V DRIVE
IC001
TIMING GENERATOR
IC620 (1/2)
IRIS DRIVE
IC620 (1/2)
IC621
SYNC GENERATOR
CN623
CCD IN
MAX GAIN
AGC REF
RV620 MAX GAIN
RV621 AGC REF
W620
CN620
IRIS DRIVE⊕
IRIS DRIVE⊖
IRIS CONT⊕
IRIS CONT⊖
RV622 IRIS
DT-73 BOARD ①
28.3750MHz
DT-73 BOARD ⑤
DT-73 BOARD ③
14.188MHz
DT-73 BOARD ⑦
DT-73 BOARD ⑥
DT-73 BOARD ⑮, ⑯
DT-73 BOARD ⑧, ⑨, ⑪
X620 28.3750MHz OSC
X621 17MHz
Q634 BUFFER
W621
S1 OUT
S2 OUT
Y OUT
AGC CONT
BACK LIGHT
CLP 0
XDL 1
XDL 2
CLP 2
CLP 3
ID
EN
DATA TO SLAVE
CLK
CAM STB
CL OUT (TG)
CL OUT (SG)
HD
VD
SYNC
BLK
BF
LALT
IC621 ①
IC621 ㉜
IC621 ㉛
IC621 ⑦
14.318MHz
VC-63P BOARD
(Siehe Seite S 91 / See page S 91)
(Siehe Seite S 143 / See page S 143)
MX-7 BOARD
IC002
MATRIX
IC001
1H DELAY
IC003
1H DELAY
FL701 LPF
Q701 BUFFER
RV707 C1 GAIN
RV705 C2 GAIN
RV706 Y1 GAIN
Q712 BUFFER
Q708,709
CS Y OUT
Q006 BUFFER
Q007 LPF
Q010 BLANKING
CS Y
C BLK
VCS GAIN
YH OUT
Q004 BUFFER
Q005 LPF
YH
AGC MIX
YL
Y GAIN
14.3MHz BPF
MX-7 BOARD ㊱
MX-7 BOARD ㉒
MX-7 BOARD ㉚, ㉝
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
HD
XDL 1
XDL 2
CLP 3
MX-7 BOARD

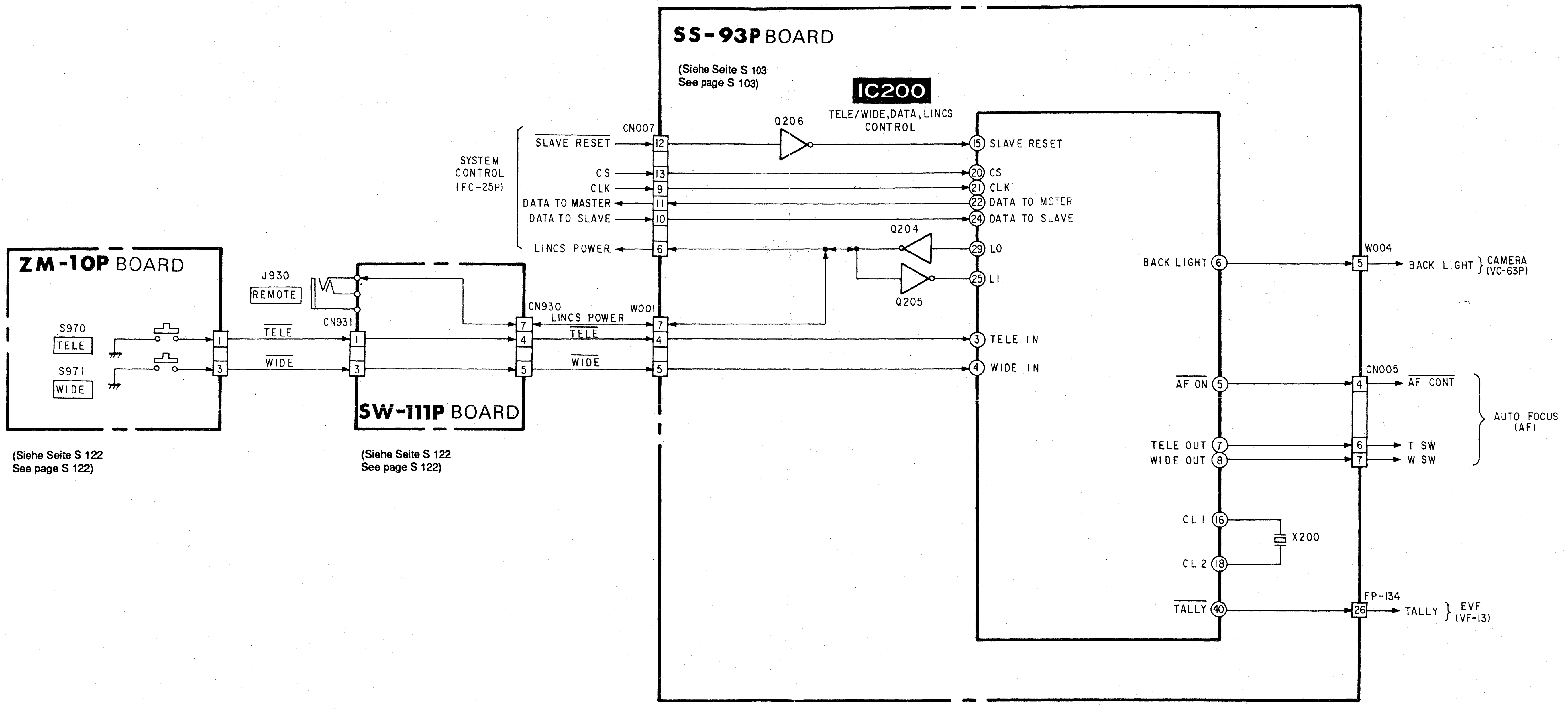

MX-7 BOARD ⑨,⑩
MX-7 BOARD ⑦,⑧
0.14Vp-p
0.22Vp-p
2H
MX-7 BOARD ㉓
MX-7 BOARD ㉖
MX-7 BOARD ㉕
0.4Vp-p
0.28Vp-p
0.59Vp-p
IC001
1H DELAY
CLAMP
1H DELAY
BUFFER
Q712
Q708,709
Q009(1/2)
Q008(1/2)
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
VDD(A)
VDD
VDD(D)
CLOCK
XDL 2
XDL 1
CLP 3
5V (W701 ㉑)
DL C1 IN
C1 OUT
DL C2 IN
YO OUT
DLY1 IN
Y1 OUT
DL Y2 IN
CLP O
LPF
CLP
CR
CB
GC
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
HD
CS GAIN
COMP
SLICE
MAX
CS Y OUT
Q006
Q007
Q010
BUFFER
BLANKING
CS Y
C BLK
HD MIX
VCS GAIN
IC003
Q001
Q002
Y DL OUT
F702,703
Q702
Y31 IN
YH OUT
YL-YH OUT
SW
MIX
Y GAIN
YL IN
AGC MIX
Q004
Q005
FL704,705
DELAY
YH
YL
YL-YH
5V
MX-7 BOARD ㊱
0.14Vp-p
MX-7 BOARD ㉒
0.3Vp-p
MX-7 BOARD ㉚,㉝
㉚:1Vp-p
㉛:0.26Vp-p
CN701
B CONT
R CONT
RV726
RV725
(Siehe Seite S 144
See page S 144)
PR-20 BOARD
RV709 B GAIN
RV708 R GAIN
RV710 CHROMA LEVEL
RV713 R-Y HUE
RV712 B-Y HUE
RV715 R-Y GAIN
RV714 B-Y GAIN
C LEVEL
C PED
G6 OUT
OFFSET CONT
G OUT
IC002
PROCESS
MATRIX
GATE DET
PED
YL MATRIX
GATE
YL MIX
R-G
B-G
R-Y
B-Y
R-Y HUE
B-Y HUE
R-Y GAIN
B-Y GAIN
Vcc
C-Y CONT
Q001,002
LOWER LIMITER
YL-YH OUT
YH OUT
Q007
MIX
Y-Y CONT
YL MIX
CLP 2
AGC CONT
5V (W701 ⑭)
IC001
BLANKING/CLAMP
CLAMP
BLANKING
Q005
TITLE (R-Y) MIX
Q006
Q003
TITLE (B-Y) MIX
Q004
PED
RV711
CHROMA BLANKING LEVEL
C BLK
PR-20 BOARD ㉒
0.5Vp-p
PR-20 BOARD ㉑
0.26Vp-p
CN704
YLPF OUT
S2
YO
Y1
CO
C1
CN705
OFFSET MTX
YH OUT
CS Y
YL-YH
ID
OFFSET PRO
G8/G WB
IC701 ⑮
0.4Vp-p
IC701
ENCODER
MODULATOR
DET
SC
BLANKING FADER SUPRESS
C OUT
C IN
FL707
3.58MHz BPF
Q705
BUFFER
Q710
BLK
RV722 BURST LEVEL
CS AGC
LALT
1/2 & ALT
1/2
4FSC
AF SC
MOD
BURST GATE
HUE
BF
Vcc(D) 5V(W701 ㉘)
Vcc(A) 5V(W701 ⑭)
FADER
SYNC CHROMA CHARACTER MIX
RV720 SYNC LEVEL
SYNC CHARACTER MIX
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
FL706
0.18μsec DELAY
RV716 SHP LEVEL
RV717 Y LEVEL
RV718 WHITE CLIP
RV719 SET UP
SYNC
BLK
CLP 2
DELAY
Q711
IC701 ㊵
0.5Vp-p
IC701 ⑯
2.6Vp-p
IC701 ㉒
1Vp-p
IC701 ㉔
0.7Vp-p
IC701 ㉖
0.28Vp-p
CN702
C OUT
FADER CONT
Y OUT
BLK
VIDEO (VA-43)
CN703
C BLK
RV724 TITLE
TY
Y BLK
DIGITAL TITLE (SS-93P)
BACK LIGHT
EN
DATA TO SLAVE
CLK
CAM STB
EVER 5V
DATA TO SLAVE
CLK
CAM STB
SYSTEM CONTROL (SS-93P)
H

3-4. AUTO FOCUS BLOCK DIAGRAM

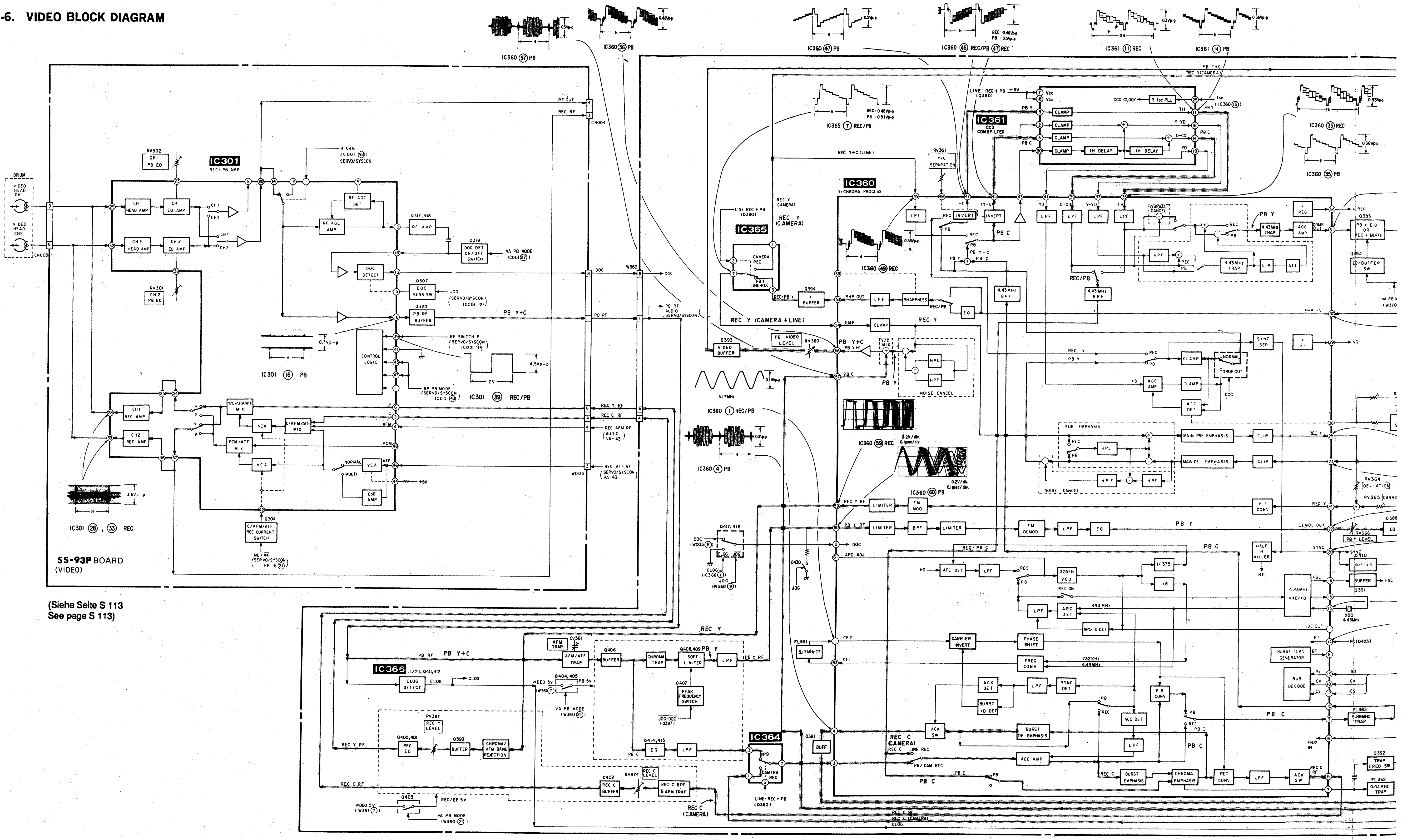

INFRARED BEEM DETECTOR
A
B
A OUT
B OUT
PUL4001
INFRARED BEEM TRANSMITTER
IRED
PUL4002
AF BLOCK UNIT
IC4001
PREAMP/INFRARED CONTROL
25 A IN
26 B IN
V REF 9
MN 8
MF 7
HL 6
MODE 1 4
MODE 2 3
CLK 5
2 IROR
1 IRFB
NN 11
FF 10
Q4001
LED DRIVE
IC4002
AUTO FOCUS CONTROL
11 VL
12 MN
13 MF
14 HL
AF SW 15
4 MODE 1
6 MODE 2
7 CLK
SOC2 3
SOC1 2
SERC
Q4002
SENSOR SWITCH
IC4003
ZOOM MOTOR DRIVE
AF BOARD
PF-NN
PF-FF
COM
SW BLOCK UNIT
PUL4006
AF CONT
W SW
T SW
DIGITAL TITTE (SS-93P)
PUL4005
TELE
WIDE
PUL4004
M906 ZOOM MOTOR
MO NN
MO FF
PUL4003
M905 FOCUS MOTOR
M

(Siehe Seite S 95
See page S 95)

3-5. ZOOM CONTROL BLOCK DIAGRAM

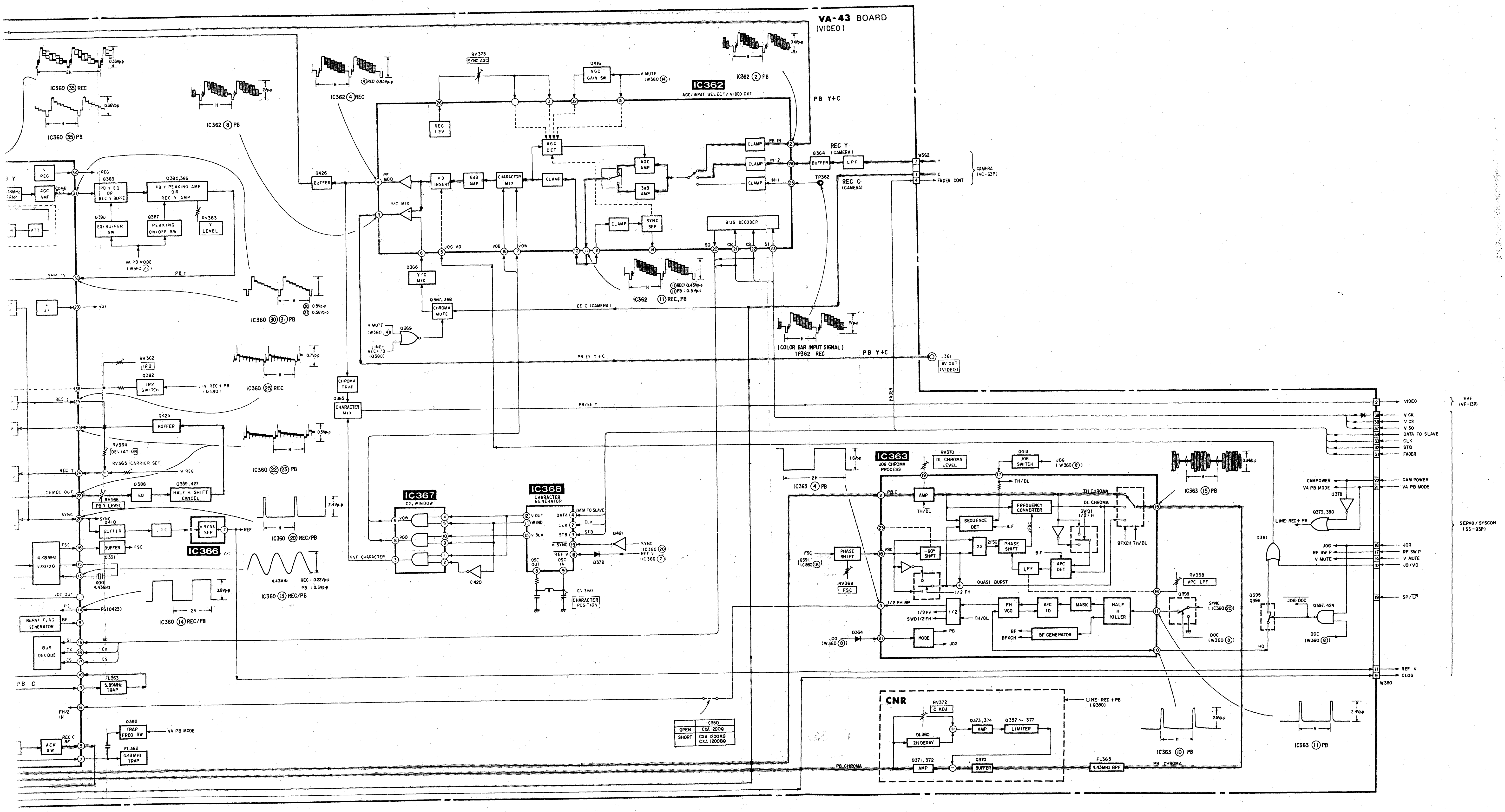

SS-93P BOARD
(Siehe Seite S 103
See page S 103)
IC200
TELE/WIDE,DATA,LINCS CONTROL
Q206
CN007
SYSTEM CONTROL (FC-25P)
SLAVE RESET
CS
CLK
DATA TO MASTER
DATA TO SLAVE
LINCS POWER
12
13
9
11
10
6
15 SLAVE RESET
20 CS
21 CLK
22 DATA TO MSTER
24 DATA TO SLAVE
Q204
29 LO
25 LI
Q205
3 TELE IN
4 WIDE IN
BACK LIGHT 6
W004
5
BACK LIGHT
CAMERA (VC-63P)
AF ON 5
CN005
4
AF CONT
AUTO FOCUS (AF)
TELE OUT 7
WIDE OUT 8
6
7
T SW
W SW
CL1 16
CL2 18
X200
TALLY 40
FP-134
26
TALLY
EVF (VF-13)
ZM-10P BOARD
S970
TELE
S971
WIDE
1
3
TELE
WIDE
(Siehe Seite S 122
See page S 122)
J930
REMOTE
CN931
SW-111P BOARD
(Siehe Seite S 122
See page S 122)
CN930
LINCS POWER
W001
7
4
5
TELE
WIDE

3-6. VIDEO BLOCK DIAGRAM

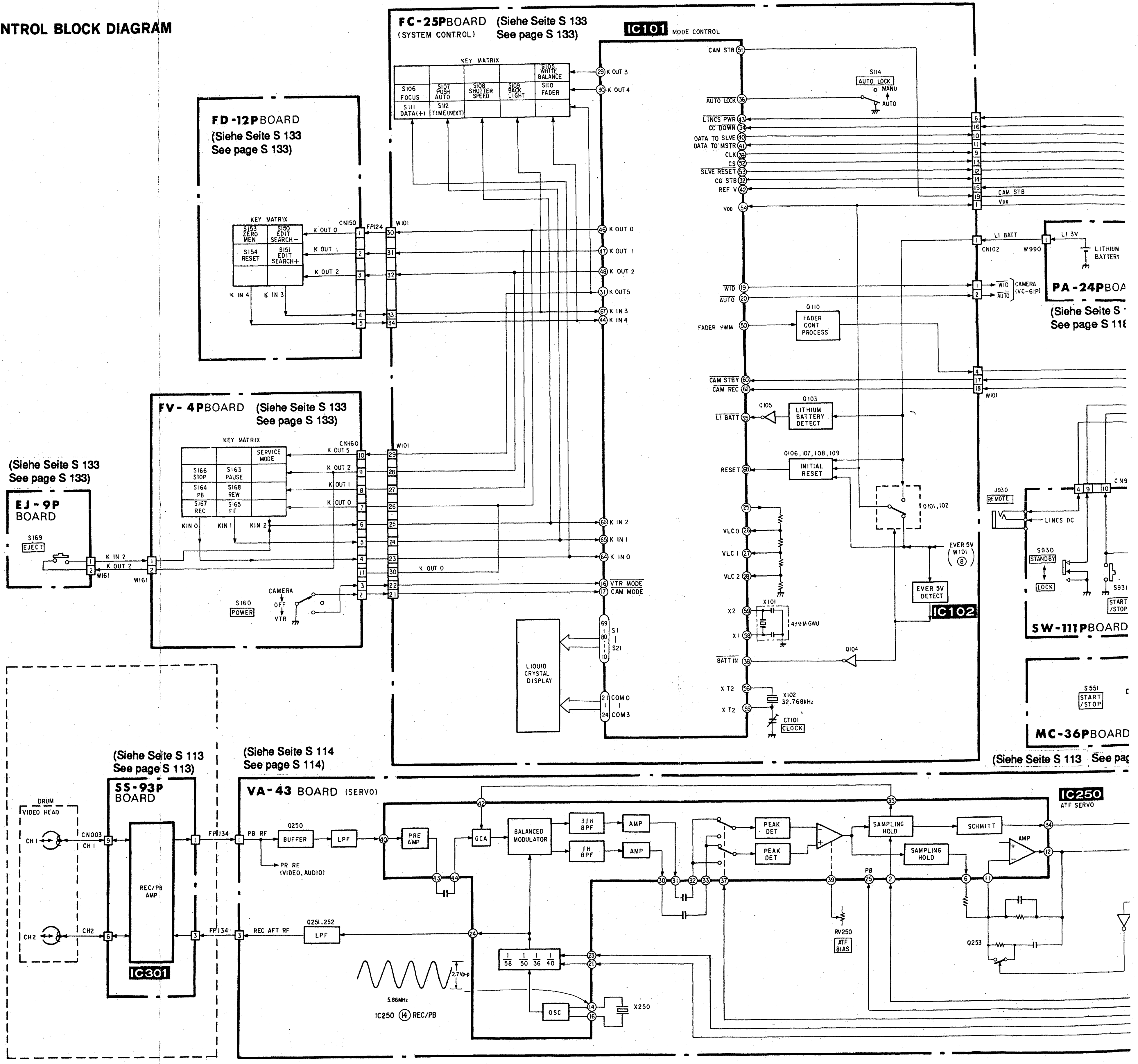

IC360 ㊼ PB
IC360 ㊺ REC/PB ㊼ REC
IC361 ⑪ REC
IC361 ⑪ PB
IC360 ㊱ REC
IC360 ㊱ PB
IC365 ⑦ REC/PB
IC360 ㊾ REC
IC360 ① REC/PB
IC360 ⑤⑨ REC
IC360 ⑥⓪ PB
IC360 ④ PB
IC301 ⑯ PB
IC301 ㊴ REC/PB
IC301 ㉘, ㉝ REC
DRUM
VIDEO HEAD CH1
VIDEO HEAD CH2
CN003
CN004
W003
W360
RV302 CH1 PB EQ
RV301 CH2 PB EQ
IC301 REC/PB AMP
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
RF AGC DET
RF AGC AMP
Q317, 318 RF AMP
Q319 DOC DET ON/OFF SWITCH
VA PB MODE (IC001 ㉗)
DOC DETECT
Q307 DOC SENS. SW
Q320 PB RF BUFFER
CONTROL LOGIC
RF SWITCH P (SERVO/SYSCON) IC001 ⑭
RP PB MODE (SERVO/SYSCON) IC001 ㊸
H CHG (IC001 ㊽) SERVO/SYSCON
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
6dB AMP
Q304 C/AFM/ATF REC CURRENT SWITCH
ME/MP (SERVO/SYSCON) FP118 ㉑
RF OUT
REC RF
DOC
PB RF
PB Y+C
REC Y RF
REC C RF
REC AFM RF (AUDIO VA-43)
REC ATF RF (SERVO/SYSCON VA-43)
PB RF AUDIO SERVO/SYSCON
SS-93P BOARD (VIDEO)
IC365
LINE REC + PB (Q380)
REC Y (CAMERA)
CAMERA REC
PB + LINE-REC
Q394 Y BUFFER
Q393 VIDEO BUFFER
PB VIDEO LEVEL
RV360
REC Y (CAMERA + LINE)
REC Y + C (LINE)
IC360 Y/CHROMA PROCESS
IC361 CCD COMBFILTER
RV361 Y/C SEPARATION
CCD CLOCK
3 fsc PLL
CLAMP
1H DELAY
INVERT
LPF
SHP OUT
SHARPNESS
EQ
EMP
Y/C MIX
HPL
HPF
NOISE CANCEL
4.43MHz BPF
4.43MHz TRAP
AGC AMP
LIM
ATT
CHROMA CANCEL
REG
SYNC SEP
NORMAL
DROP OUT
SUB EMPHASIS
MAIN PRE EMPHASIS
MAIN DE EMPHASIS
CLIP
LIMITER
FM MOD
BPF
FM DEMOD
V-I CONV
RV364 DEVIATION
RV365 CARRIER
RV366 PB Y LEVEL
HALF H KILLER
AFC DET
375fH VCO
APC DET
APC-ID DET
1/375
1/8
4.43MHz VXO/XO
X001 4.43MHz
Q410 BUFFER
Q391 BUFFER
CARRIER INVERT
PHASE SHIFT
FREQ CONV
732KHz 4.43MHz
ACK DET
SYNC DET
BURST ID DET
PB CONV
ACC DET
ACK SW
BURST DE EMPHASIS
ACC AMP
BURST EMPHASIS
CHROMA EMPHASIS
REC CONV
BURST FLAG GENERATOR
BUS DECODE
FL363 5.89MHz TRAP
Q392 TRAP FREQ SW
FL362 4.43MHz TRAP
FL361 5.17MHz CF
5.17MHz
CF1
CF2
Q417, 418 CLOG JOG
DOC (W003 ⑧)
CLOG (IC366 ①)
JOG (W360 ⑨)
Q430
IC364
Q381 BUFF
LINE: REC + PB (Q380)
REC C (CAMERA)
REC C RF
REC C (CAMERA)
CLOG
IC366 (1/2), Q411, 412
CLOG DETECT
CV361 AFM TRAP
AFM/ATF TRAP
Q406 BUFFER
CHROMA TRAP
Q408, 409 SOFT LIMITER
Q407 PEAK FREQUENCY SWITCH
JOG·DOC (Q397)
Q404, 405
VIDEO 5V (W361 ⑦)
VA PB MODE (W360 ㉑)
Q414, 415 EQ
RV367 REC Y LEVEL
Q400, 401 REC EQ
Q399 BUFFER
CHROMA/AFM BAND REJECTION
Q402 REC C BUFFER
RV374 REC C LEVEL
REC C BPF & AFM TRAP
Q403 REC/EE 5V
PB Y
PB C
REC Y
REC C

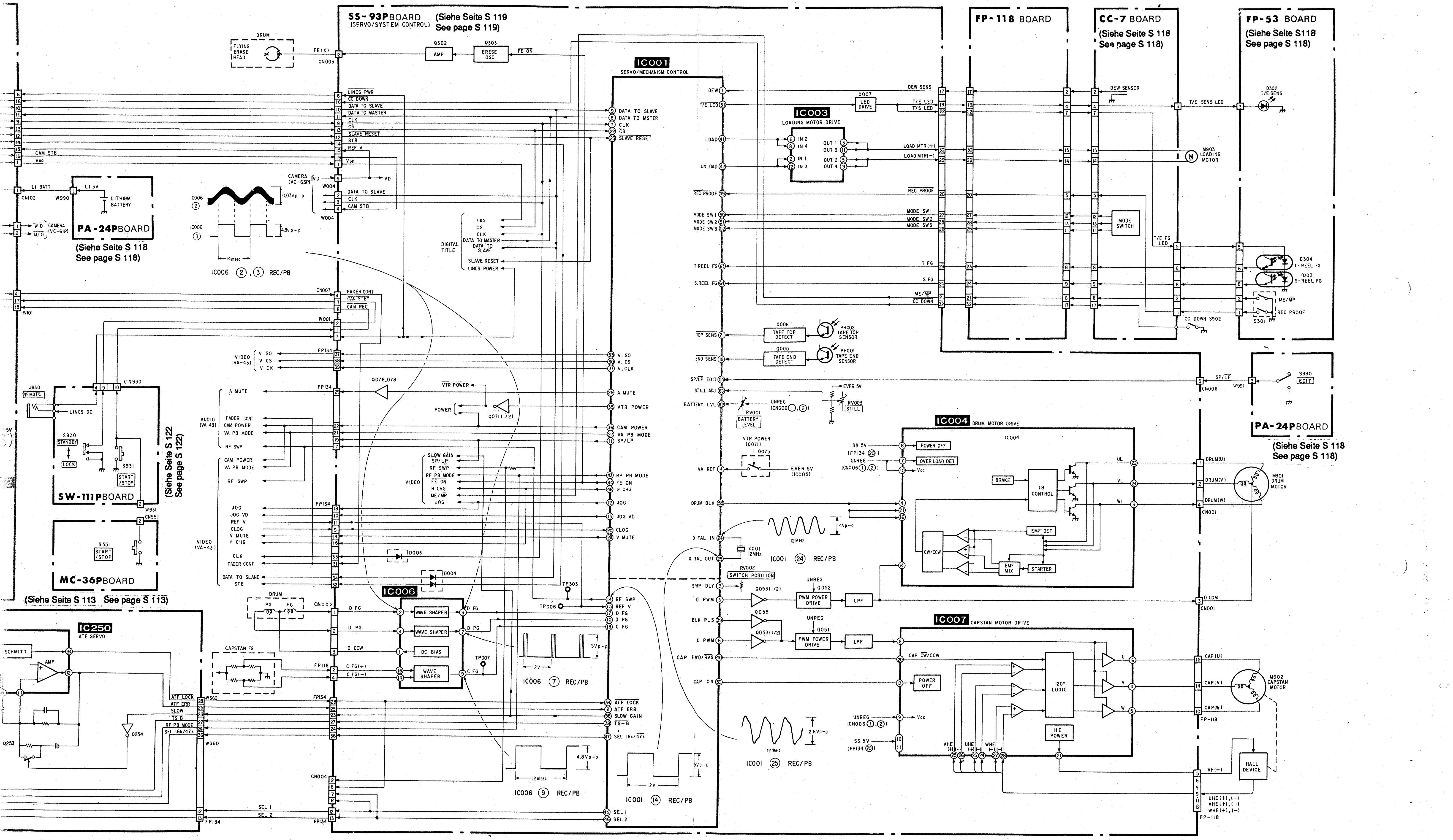
(Siehe Seite S 113
See page S 113)

(Siehe Seite S 114
See page S 114)


VA-43 BOARD
(VIDEO)
IC362
AGC/INPUT SELECT/VIDEO OUT
IC363
JOG CHROMA PROCESS
IC366
IC367
CG WINDOW
IC368
CHARACTER GENERATOR
CNR
IC360 ㉟ REC
IC360 ㉟ PB
IC362 ⑧ PB
IC362 ④ REC
IC362 ② PB
IC362 ⑪ REC, PB
IC360 ㉚㉛ PB
IC360 ㉕ REC
IC360 ㉒㉓ PB
IC360 ⑳ REC/PB
IC360 ⑬ REC/PB
IC360 ⑭ REC/PB
IC363 ④ PB
IC363 ⑮ PB
IC363 ⑩ PB
IC363 ⑪ PB
(COLOR BAR INPUT SIGNAL)
TP362 REC
PB Y+C
REC Y
REC C
PB CHROMA
PB EE Y+C
PB/EE Y
EE C (CAMERA)
AGC DET
AGC AMP
3dB AMP
CLAMP
SYNC SEP
BUS DECODER
VD INSERT
6dB AMP
CHARACTOR MIX
REG 1.2V
BUFFER
CHROMA TRAP
CHARACTER MIX
Y/C MIX
CHROMA MUTE
LPF
W362
CAMERA (VC-63P)
FADER CONT
J361
AV OUT (VIDEO)
EVF (VF-13P)
VIDEO
V CK
V CS
V SO
DATA TO SLAVE
CLK
STB
FADER
CAM POWER
VA PB MODE
SERVO/SYSCON (SS-93P)
JOG
RF SW P
V MUTE
JO/VD
SP/LP
REF V
CLOG
W360
AMP
FREQUENCY CONVERTER
SEQUENCE DET
PHASE SHIFT
X2
-90° SHIFT
APC DET
FH VCO
AFC ID
MASK
HALF H KILLER
BF GENERATOR
MODE
JOG SWITCH
RV370 DL CHROMA LEVEL
RV368 APC LPF
RV369 FSC
RV372 C ADJ
2H DERAY
LIMITER
4.43MHz BPF
PB Y PEAKING AMP OR REC Y AMP
PB Y EQ OR REC Y BUFFER
EQ/BUFFER SW
PEAKING ON/OFF SW
HALF H SHIFT CANCEL
4.43MHz VXO/XO
BURST FLAG GENERATOR
BUS DECODE
5.89MHz TRAP
TRAP FREQ SW
4.43MHz TRAP
ACK SW
IC360
OPEN CXA 1200Q
SHORT CXA 1200AQ CXA 1200BQ
CHARACTER POSITION

3-7. SERVO/SYSTEM CONTROL BLOCK DIAGRAM


FC-25P BOARD (SYSTEM CONTROL) (Siehe Seite S 133 See page S 133)
IC101 MODE CONTROL
KEY MATRIX
S106 FOCUS
S107 PUSH AUTO
S108 SHUTTER SPEED
S109 BACK LIGHT
S105 WHITE BALANCE
S110 FADER
S111 DATA(+)
S112 TIME(NEXT)
K OUT 3
K OUT 4
CAM STB
AUTO LOCK
LINCS PWR
CC DOWN
DATA TO SLVE
DATA TO MSTR
CLK
CS
SLVE RESET
CG STB
REF V
VDD
S114 AUTO LOCK
MANU
AUTO
K OUT 0
K OUT 1
K OUT 2
K OUT5
K IN 3
K IN 4
WID
AUTO
FADER PWM
Q110 FADER CONT PROCESS
CAM STBY
CAM REC
LI BATT
Q105
Q103 LITHIUM BATTERY DETECT
RESET
Q106,107,108,109 INITIAL RESET
Q101,102
VLC0
VLC1
VLC2
K IN 2
K IN 1
K IN 0
VTR MODE
CAM MODE
X2
X1
X101 4.19MGWU
EVER 5V W101 (8)
EVER 5V DETECT
IC102
BATT IN
Q104
XT2
X102 32.768kHz
CT101 CLOCK
S1
S21
COM 0
COM 3
LIQUID CRYSTAL DISPLAY
FD-12P BOARD (Siehe Seite S 133 See page S 133)
KEY MATRIX
S153 ZERO MEN
S150 EDIT SEARCH−
S154 RESET
S151 EDIT SEARCH+
K IN 4
K IN 3
CN150
FP124
W101
FV-4P BOARD (Siehe Seite S 133 See page S 133)
KEY MATRIX
SERVICE MODE
S166 STOP
S163 PAUSE
S164 PB
S168 REW
S167 REC
S165 FF
KIN 0
KIN 1
KIN 2
CN160
K OUT 5
S160 POWER
CAMERA OFF VTR
EJ-9P BOARD (Siehe Seite S 133 See page S 133)
S169 EJECT
W161
CN102
W990
LI BATT
LI 3V
LITHIUM BATTERY
CAMERA (VC-6P)
PA-24P BOARD (Siehe Seite S 118 See page S 118)
CAM STB
VDD
J930 REMOTE
LINCS DC
S930 STANDBY
LOCK
S931 START /STOP
SW-111P BOARD
S551 START /STOP
MC-36P BOARD (Siehe Seite S 113 See page
SS-93P BOARD (Siehe Seite S 113 See page S 113)
DRUM VIDEO HEAD
CH1
CH2
CN003
REC/PB AMP
IC301
FP134
VA-43 BOARD (SERVO) (Siehe Seite S 114 See page S 114)
PB RF
Q250 BUFFER
LPF
PR RF (VIDEO, AUDIO)
REC AFT RF
Q251,252 LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
AMP
PEAK DET
SAMPLING HOLD
SCHMITT
AMP
IC250 ATF SERVO
RV250 ATF BIAS
Q253
OSC
X250
2.7Vp-p
5.86MHz
IC250 (14) REC/PB


SS-93P BOARD (SERVO/SYSTEM CONTROL)
(Siehe Seite S 119 See page S 119)
FP-118 BOARD
CC-7 BOARD
(Siehe Seite S 118 See page S 118)
FP-53 BOARD
(Siehe Seite S118 See page S 118)
IC001 SERVO/MECHANISM CONTROL
IC003 LOADING MOTOR DRIVE
IC004 DRUM MOTOR DRIVE
IC006
IC007 CAPSTAN MOTOR DRIVE
IC250 ATF SERVO
DRUM
FLYING ERASE HEAD
FE(X)
CN003
Q302 AMP
Q303 ERESE OSC
FE ON
LINCS PWR
CC DOWN
DATA TO SLAVE
DATA TO MASTER
CLK
CS
SLAVE RESET
STB
REF V
Vcc
CAM STB
CAMERA (VC-63P)
VD
W004
LI BATT
CN102
W990
LI 3V
LITHIUM BATTERY
PA-24P BOARD
(Siehe Seite S 118 See page S 118)
WID
AUTO
CAMERA (VC-61P)
IC006 ② 0.03Vp-p
IC006 ③ 4.8Vp-p
14msec
IC006 ②, ③ REC/PB
Vdd
CS
CLK
DATA TO MASTER
DATA TO SLAVE
SLAVE RESET
LINCS POWER
DIGITAL TITLE
CN007
FADER CONT
CAM STBY
CAM REC
W101
W001
FP134
VIDEO (VA-43)
V SO
V CS
V CK
A MUTE
Q076,078
VTR POWER
POWER
Q071(1/2)
AUDIO (VA-43)
FADER CONT
CAM POWER
VA PB MODE
RF SWP
CAM POWER
VA PB MODE
RF SWP
SLOW GAIN
SP/LP
RF SWP
RF PB MODE
FE ON
H CHG
ME/MP
JOG
VIDEO
JOG
JOG VD
REF V
CLOG
V MUTE
H CHG
CLK
FADER CONT
DATA TO SLAVE
STB
D003
D004
J930 REMOTE
LINCS DC
S930 STANDBY
LOCK
S931 START/STOP
SW-111P BOARD
(Siehe Seite S 122 See page S 122)
CN930
W931
CN551
S551 START/STOP
MC-36P BOARD
(Siehe Seite S 113 See page S 113)
SCHMITT
AMP
Q253
Q254
ATF LOCK
ATF ERR
SLOW
TS B
RP PB MODE
SEL 16k/47k
W360
DRUM PG FG
CN002
D FG
D PG
D COW
CAPSTAN FG
FP118
C FG(+)
C FG(-)
WAVE SHAPER
DC BIAS
WAVE SHAPER
TP007
TP303
TP006
5Vp-p
2V
IC006 ⑦ REC/PB
4.8Vp-p
12msec
IC006 ⑨ REC/PB
CN004
SEL 1
SEL 2
DATA TO SLAVE
DATA TO MSTER
CLK
CS
SLAVE RESET
V.SO
V.CS
V.CLK
A MUTE
VTR POWER
CAM POWER
VA PB MODE
SP/LP
RP PB MODE
FE ON
H CHG
JOG
JOG VD
CLOG
V MUTE
RF SWP
REF V
D FG
D PG
C FG
ATF LOCK
ATF ERR
SLOW GAIN
TS-B
SEL 16k/47k
5Vp-p
2V
IC001 ⑭ REC/PB
DEW
T/E LED
LOAD
UNLOAD
REC PROOF
MODE SW1
MODE SW2
MODE SW3
T REEL FG
S.REEL FG
TOP SENS
END SENS
SP/LP EDIT
STILL ADJ
BATTERY LVL
VA REF
DRUM BLK
X TAL IN
X TAL OUT
SWP DLY
D PWM
BLK PLS
C PWM
CAP FWD/RVS
CAP ON
Q007 LED DRIVE
IN 2
IN 4
IN 1
IN 3
OUT 1
OUT 3
OUT 2
OUT 4
DEW SENS
T/E LED
T/S LED
LOAD MTR(+)
LOAD MTR(-)
REC PROOF
MODE SW1
MODE SW2
MODE SW3
T FG
S FG
ME/MP
CC DOWN
Q006 TAPE TOP DETECT
PH002 TAPE TOP SENSOR
Q005 TAPE END DETECT
PH001 TAPE END SENSOR
EVER 5V
RV003 STILL
UNREG (CN006①,②)
RV001 BATTERY LEVEL
VTR POWER (Q071)
Q075
EVER 5V (IC005)
4Vp-p
12MHz
X001 12MHz
IC001 ㉔ REC/PB
RV002 SWITCH POSITION
Q053(1/2)
UNREG
Q052
PWM POWER DRIVE
LPF
Q055
Q051
Q053(1/2)
2.6Vp-p
12 MHz
IC001 ㉕ REC/PB
DEW SENSOR
MODE SWITCH
T/E FG LED
CC DOWN S902
T/E SENS LED
D302 T/E SENS
M903 LOADING MOTOR
D304 T-REEL FG
D303 S-REEL FG
ME/MP
REC PROOF
S301
SP/LP
CN006
W991
S990 EDIT
PA-24P BOARD
(Siehe Seite S 118 See page S 118)
SS 5V (FP134 ⑳)
UNREG (CN006①,②)
POWER OFF
OVER LOAD DET
Vcc
BRAKE
18 CONTROL
EMF DET
CW/CCW
EMF MIX
STARTER
UL
VL
WL
DRUM(U)
DRUM(V)
DRUM(W)
CN001
M901 DRUM MOTOR
D COM
CAP CW/CCW
POWER OFF
120° LOGIC
HE POWER
UNREG (CN006①,②)
SS 5V (FP134 ⑳)
VHE(+)(-)
UHE(+)(-)
WHE(+)(-)
CAP(U)
CAP(V)
CAP(W)
FP-118
M902 CAPSTAN MOTOR
VH(+)
HALL DEVICE
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)

3-8. MECHANISM CONTROLLER (μPD78112-GF)

This is the 8-bit, single chip microprocessor having the following characteristics.

- μCOM-78K/I
- high speed instruction execution
  Instruction cycle : 333ns/12MHz
- On-chip memory mapping for peripheral hardware (special function register)
- On-chip high function interrupt controller
  Two kinds of processing forms (vector interrupt function/ macro service function)
- On-chip high precision A/D converter
  8 bit precision : 8 analog inputs
  One analog input conversion time : 26.7μs/12MHz
- On-chip hardware suitable for servo control of VTR, etc. (servo control unit)
  16 bit free running counter+capture register×2
  special pulse output control function 12 bit precision PWM output×2

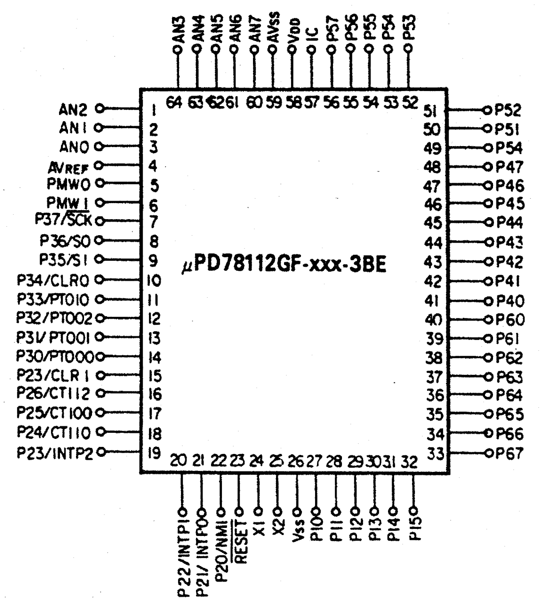

AN3
AN4
AN5
AN6
AN7
AVss
VDD
IC
P57
P56
P55
P54
P53
64 63 62 61 60 59 58 57 56 55 54 53 52
AN2 1
AN1 2
AN0 3
AVREF 4
PMW0 5
PMW1 6
P37/SCK 7
P36/SO 8
P35/SI 9
P34/CLR0 10
P33/PTO10 11
P32/PTO02 12
P31/PTO01 13
P30/PTO00 14
P23/CLR1 15
P26/CTI12 16
P25/CTI00 17
P24/CTI10 18
P23/INTP2 19
μPD78112GF-xxx-3BE
51 P52
50 P51
49 P54
48 P47
47 P46
46 P45
45 P44
44 P43
43 P42
42 P41
41 P40
40 P60
39 P61
38 P62
37 P63
36 P64
35 P65
34 P66
33 P67
20 21 22 23 24 25 26 27 28 29 30 31 32
P22/INTP1
P21/INTP0
P20/NMI
RESET
X1
X2
Vss
P10
P11
P12
P13
P14
P15

Fig. 1. μPD78112 pin assignment diagram

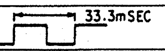
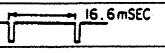
Pin No.	Signal name	I/O	Signal status	Function
1	DEW	I	Analog input	DEW detecting pin. When DEW (condensation) occurs, more than 430mV generates.
2	ATF ERR	I	Analog input	ATF ERROR input pin.
3	SWP DLY	I	Analog input	RF SWP adjustment input pin.
4	VA REF	O		A/D converter reference voltage input pin.
5	D PWM	O	PWM output	Drum motor drive signal.
6	C PWM	O	PWM output	Capstan motor drive signal.
7	CLK	I		Serial communication clock input.
8	DATA TO MSTR	O		Data output pin for the data to be sent to mode control CPU.
9	DATA TO SLVE	I		Data input pin for the data coming from the mode control CPU.
10	D PG	I		Drum PG input pin.
11	SP/$\overline{\text{LP}}$	O	Logic status	Playback mode output pin. SP="H", LP="L"
12	JOG	O	Logic status	Video circuit normal/variable speed playback select signal. "H" during STILL, SLOW, FRAM, CUE/REV, FR SEARCH, REC REV, EDIT CUE, EDIT REV.
13	JOG VD	O	Logic status	False VD output inserted into video signal during variable speed playback mode.
14	RF SWP	O	 33.3mSEC	RF SWP output pin.
15	REF V	I	 16.6mSEC	REF V input pin.
16				
17	D FG	I		Drum FG input.
18	C FG	I		Capstan FG input.
19	$\overline{\text{END SENS}}$	I	Logic status	END-side END sensor input.

Table 1 (1)

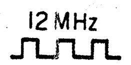
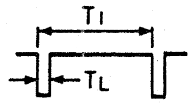
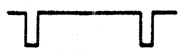
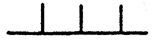
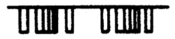
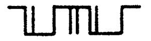
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>20</td><td>CLOG</td><td>I</td><td>Logic status</td><td>Head clogging detect input.</td></tr>
<tr><td>21</td><td>$\overline{\text{TOP SENS}}$</td><td>I</td><td>Logic status</td><td>TOP-side TOP sensor input.</td></tr>
<tr><td>22</td><td>$\overline{\text{CS}}$</td><td>I</td><td>Logic status</td><td>Input signal to start data communication. Starting at fall-down edge.</td></tr>
<tr><td>23</td><td>$\overline{\text{SLVE RESET}}$</td><td>I</td><td>Logic status</td><td>RESET input. "L" RESET.</td></tr>
<tr><td>24</td><td>X'TAL IN</td><td>I</td><td rowspan="2"> </td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>25</td><td>X'TAL OUT</td><td>O</td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>26</td><td>V_{SS}</td><td></td><td></td><td>GND pin</td></tr>
<tr><td>27</td><td>VA PB MODE</td><td>O</td><td>Logic status</td><td>Video, audio REC/PB select signal. "H" during PB.</td></tr>
<tr><td>28</td><td>V MUTE</td><td>O</td><td>Logic status</td><td>Video, muting signal. "H" during muting.</td></tr>
<tr><td>29</td><td>A MUTE</td><td>O</td><td>Logic status</td><td>Audio, muting signal. "H" during muting.</td></tr>
<tr><td>30</td><td>VIDEO CS</td><td>O</td><td> </td><td>Input signal to start video data communication.</td></tr>
<tr><td>31</td><td>$\overline{\text{T/E LED}}$</td><td>O</td><td> </td><td>Tape top/end detecting LED ON/OFF.
Reel rotation detecting LED ON/OFF.<table><tr><th>mode</th><th>REC/PB</th><th>CUE/REV</th><th>FF/REW</th></tr><tr><td>T_1</td><td>100</td><td>14</td><td>2</td></tr><tr><td>T_L</td><td>1</td><td>1</td><td>1</td></tr></table>(unit in msec)</td></tr>
<tr><td>32</td><td></td><td></td><td></td><td></td></tr>
<tr><td>33</td><td>CAP ON</td><td>O</td><td>Logic status</td><td>Capstan motor ON/OFF signal. "H" level means capstan motor ON.</td></tr>
<tr><td>34</td><td>$\overline{\text{ATF LOCK}}$</td><td>I</td><td>Logic status</td><td>"L" when PB mode ATF phase servo is normally phase-locked.</td></tr>
<tr><td>35</td><td>VTR Power</td><td>O</td><td>Logic status</td><td rowspan="2">DC-DC converter ON/OFF signal.<table><tr><th>mode</th><th>VTR Power</th><th>CAM Power</th></tr><tr><td>VTR</td><td>"H"</td><td>"L"</td></tr><tr><td>OFF</td><td>"L"</td><td>"L"</td></tr><tr><td>CAM</td><td>"H"</td><td>"H"</td></tr></table></td></tr>
<tr><td>36</td><td>CAM Power</td><td>O</td><td>Logic status</td></tr>
<tr><td>37</td><td>VIDEO CLK</td><td>I</td><td> </td><td>Clock for video serial data communication.</td></tr>
<tr><td>38</td><td>TS B</td><td>O</td><td></td><td>ATF LOCK sampling hold signal. "L" during sampling mode. "H" during hold mode.</td></tr>
<tr><td>39</td><td>CAP BLK</td><td>O</td><td>Logic status</td><td>This is the signal that applies full voltage to capstan motor.</td></tr>
<tr><td>40</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td>Logic status</td><td>Capstan motor rotating direction select signal. "H" during normal direction (FWD) rotation.</td></tr>
<tr><td>41</td><td>LOAD</td><td>O</td><td>Logic status</td><td rowspan="2">Threading motor control signal.<table><tr><th>Operation / Signal name</th><th>LOAD</th><th>UNLOAD</th><th>BRAKE</th></tr><tr><td>LOAD</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>H</td><td>H</td></tr></table></td></tr>
<tr><td>42</td><td>UNLOAD</td><td>O</td><td>Logic status</td></tr>
<tr><td>43</td><td>RP PB MODE</td><td>O</td><td>Logic status</td><td>REC/PB amplifier REC/PB select signal. "H" during PB.</td></tr>
<tr><td>44</td><td>$\overline{\text{FE ON}}$</td><td>O</td><td>Logic status</td><td>Flying erase oscillation ON/OFF signal, "L" during oscillation.</td></tr>
</table>

Table 1 (2)

<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>45</td><td>SEL1</td><td>O</td><td>Logic status</td><td rowspan="2">ATF REF PILOT signal frequency control.<table><tr><th>ATF REF PILOT</th><th>f_1</th><th>f_2</th><th>f_3</th><th>f_4</th></tr><tr><td>SEL1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td></tr>
<tr><td>46</td><td>SEL2</td><td>O</td><td>Logic status</td></tr>
<tr><td>47</td><td>SEL 16K/$\overline{\text{47K}}$</td><td>O</td><td>Logic status</td><td>ATF BPF select signal. "L" when detecting ATF error in f1 and f3 tracks.
"H" when detecting ATF error in f2 and f4 tracks.</td></tr>
<tr><td>48</td><td>HCHG</td><td>O</td><td>Logic status</td><td>Head select signal. "H"=CH-1' "L"=CH-1.</td></tr>
<tr><td>49</td><td>$\overline{\text{REC PROOF SW}}$</td><td>I</td><td>Logic status</td><td>"H" when cassette's erroneous erasure preventing switch is set in the erasure prevention side.</td></tr>
<tr><td>50</td><td>MSW1</td><td>I</td><td>Logic status</td><td rowspan="3">Mechanism mode switch input (three bit structure, mechanical position detection)</td></tr>
<tr><td>51</td><td>MSW2</td><td>I</td><td>Logic status</td></tr>
<tr><td>52</td><td>MSW3</td><td>I</td><td>Logic status</td></tr>
<tr><td>53</td><td>VIDEO SO</td><td>O</td><td> </td><td>Data line for the data to be sent to CXA1201.</td></tr>
<tr><td>54</td><td>$\overline{\text{EDIT}}$</td><td>I</td><td></td><td>Input signal for EDIT selection. "H" : OFF. "L" : ON</td></tr>
<tr><td>55</td><td>DRUM BLK</td><td>O</td><td>Logic status</td><td>Slow mode drum fH compensation drum brake signal.</td></tr>
<tr><td>56</td><td>SLOW GAIN</td><td>O</td><td>Logic status</td><td>ATF ERROR's gain select signal.</td></tr>
<tr><td>57</td><td>VPP</td><td></td><td></td><td>Fixed to power supply voltage.</td></tr>
<tr><td>58</td><td>V_{DD}</td><td></td><td></td><td>Power supply pin.</td></tr>
<tr><td>59</td><td>AV_{SS}</td><td></td><td></td><td>A/D converter's GND pin.</td></tr>
<tr><td>60</td><td>STILL ADJ</td><td>I</td><td></td><td>Const. Resistornce input.</td></tr>
<tr><td>61</td><td></td><td></td><td></td><td></td></tr>
<tr><td>62</td><td>BATT LVL</td><td>I</td><td>Analog input</td><td>BATTERY LEVEL input. This is input at approx. 1/2.</td></tr>
<tr><td>63</td><td>T REEL FG</td><td>I</td><td>Analog input</td><td>Take-up side REEL FG input. Used to detect reel rotation.</td></tr>
<tr><td>64</td><td>S REEL FG</td><td>I</td><td>Analog input</td><td>Supply side REEL FG input. Used to detect reel rotation.</td></tr>
</table>

Table 1 (3)

3-9. SYSTEM CONTROL-CAMERA BLOCK INTERFACE

Signal	I/O	Pin No.	Input/Output Level
$\overline{\text{AF ON}}$	O	SS-93P board IC200 ⑤	"L" when auto focus in ON.
$\overline{\text{TELE IN}}$	I	SS-93P board IC200 ③	"L" when zoom switch TELE is pressed.
$\overline{\text{WIDE IN}}$	I	SS-93P board IC200 ④	"L" when zoom switch WIDE is pressed.
$\overline{\text{TALLY}}$	O	SS-93P board IC200㊵	"L" when in CAMERA mode and REC mode.
CAM STB	O	FC-25P board IC101(51)	4V cycle "H" pulse. () Strobe signal for serial data transmission.
CLK	O	FC-25P board IC101㊴	2V cycle "L" pulse series. () Serial data transmission clock.
DATA TO SLAVE	O	FC-25P board IC101㊵	2V cycle pulse series. () Serial data transmission.
TELE OUT	O	SS-93P board IC200 ⑦	"H" during the zoom motor is rotating TELE direction.
WIDE OUT	O	SS-93P board IC200 ⑧	"H" during the zoom motor is rotating WIDE direction.
BACK LIGHT	O	SS-93P board IC200 ⑥	"H" during Back Light is lit.

3-10. SYSTEM CONTROL—VIDEO, AUDIO BLOCK INTERFACE

Signal	I/O	Pin No.	VTR					
			STOP	FF	REW	FR SEARCH		PB
						CUE	REVIEW	
SP/$\overline{\text{LP}}$	O	SS-93P board IC001⑪	H	H	H	＊1	＊1	＊2
JOG	O	SS-93P board IC001⑫	L	L	L	H	H	L
JOG VD	O	SS-93P board IC001⑬	L	L	L	＊3	＊3	L
RF SWP	O	SS-93P board IC001⑭	H/L	＊4	＊4	＊4	＊4	＊4
REF V	O	SS-93P board IC001⑮	＊5	＊5	＊5	L	L	L
CLOG	I	SS-93P board IC001⑳	H	＊6	＊6	＊6	＊6	＊6
VA PB MODE	O	SS-93P board IC001㉗	L	L	L	H	H	H
V MUTE	O	SS-93P board IC001㉘	L	L	L	L	L	L
A MUTE	O	SS-93P board IC001㉙	L	L	L	H	H	L
CAM PWR	O	SS-93P board IC001㊱	L	L	L	L	L	L
RP PB MODE	O	SS-93P board IC001㊸	H	H	H	H	H	H
$\overline{\text{FE ON}}$	O	SS-93P board IC001㊹	H	H	H	H	H	H
TAPE2/$\overline{\text{TAPE1}}$	O	FP-53 board S301	"L" when using MP type tape.					
$\overline{\text{EDIT}}$	O	PA-24P board S990	"L" when EDIT switch (PA-24 board S990) is turuned ON.					
DATA TO SLAVE	O	FC-25P board IC101㊵	V cycle "L" pulse series (VTR mode)					
CLK	O	FC-25P board IC101㊴	V cycle "L" pulse series (VTR mode)					
CG STB	O	FC-25P board IC101㉜	L	L	L	L	L	L

＊1 Outputs identification results is PB mode immediately preceding. SP mode "H", LP mode "L".

＊2 Outputs identification results of playback tape recording mode (SP/LP). SP mode "H", LP mode "L".

＊3 False VD signal (V cycle "H" pulse)

＊4 30Hz 50% duty pulse. Synchronized to drum rotation.

＊5 V cycle "L" pulse separated from line input video signal or camera video signal.

＊6 "H" at tape no signal portion or dropout portion. Input for head clogging detection.

＊9 V cyclse pulse.

＊10 2V cyclse pulse. (

＊11 2V cyclse pulse series.

3-11. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	VTR					
			STOP	FF	REW	FR SEARCH		PB
						CUE	REVIEW	
ATF ERR	I	SS-93P board IC001②		＊1	＊1	＊2	＊2	＊2
SWP DLY ＊3	I	SS-93P board IC001③						
D PWM	O	SS-93P board IC001⑤	L	＊4	＊4	＊4	＊4	＊4
C PWM	O	SS-93P board IC001⑥	L	＊5	＊5	＊5	＊5	＊5
D PG	I	SS-93P board IC001⑩	L	＊6	＊6	＊6	＊6	＊6
RF SWP	O	SS-93P board IC001⑭	H/L	＊7	＊7	＊7	＊7	＊7
REF V	I	SS-93P board IC001⑮	＊8	＊8	＊8	L	L	L
D FG	I	SS-93P board IC001⑰	H	＊9	＊9	＊9	＊9	＊9
C FG	I	SS-93P board IC001⑱	H/L	＊10	＊10	＊11	＊12	＊13
CAP ON	O	SS-93P board IC001㉝	L	H	H	H	H	H
$\overline{\text{ATF LOCK}}$	I	SS-93P board IC001㉞		H	H	H	H	L
$\overline{\text{TS B}}$	O	SS-93P board IC001㊳	H	H	H	H	H	＊15
CAP BLK	O	SS-93P board IC001㊴	L	L	L	L	L	L
CAP FWD/$\overline{\text{RVS}}$	O	SS-93P board IC001㊵	H	H	L	H	L	H
SEL1	O	SS-93P board IC001㊺	L	L	L	＊18	＊19	＊15
SEL2	O	SS-93P board IC001㊻	L	L	L	＊18	＊19	＊15
SEL 16K/$\overline{\text{47K}}$	O	SS-93P board IC001㊼	L	L	L	＊18	＊19	＊15
SLOW GAIN	O	SS-93P board IC001(55)	L	L	L	L	L	L

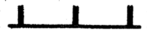
＊1 Fixed voltage approx. 2V DC.

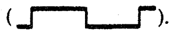
＊2 ATF error voltage.

＊3 DC voltage set by RV002 is input.

＊4 53μsec cycle PWM wave. Duty ratio changes according to drum error signal.

＊5 53μsec cycle PWM wave. Duty ratio changes according to capstan error signal.

＊6 V cycle "H" pulse. ()

＊7 30Hz 50% duty pulse (). Synchronized to drum rotation.

＊8 V cycle "L" pulse separated from line input

＊9 720Hz pulse

＊10 Approx. 16500Hz pulse

＊11 Approx. 5900Hz pulse (SP mode)

＊12 Approx. 5600Hz pulse (SP mode)

＊13 Approx. 826Hz pulse (SP mode)

＊14 Pulse input during step-by-step.

e.

)

E direction.

E direction.

3-10. SYSTEM CONTROL—VIDEO, AUDIO BLOCK INTERFACE

Signal	I/O	Pin No.	VTR mode													CAMERA mode			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REVIEW	REC
						CUE	REVIEW		CUE	REVIEW									
SP/$\overline{\text{LP}}$	O	SS-93P board IC001⑪	H	H	H	* 1	* 1	* 2	* 1	* 1	* 1	* 1	* 1	H	H	H	H	H	H
JOG	O	SS-93P board IC001⑫	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
JOG VD	O	SS-93P board IC001⑬	L	L	L	* 3	* 3	L	* 3	* 3	* 3	* 3	* 3	L	L	L	* 3	* 3	L
RF SWP	O	SS-93P board IC001⑭	H/L	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4
REF V	O	SS-93P board IC001⑮	* 5	* 5	* 5	L	L	L	L	L	L	L	L	* 5	* 5	* 5	L	L	* 5
CLOG	I	SS-93P board IC001⑳	H	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	H			* 6	* 6	H
VA PB MODE	O	SS-93P board IC001㉗	L	L	L	H	H	H	H	H	H	H	H	L	L	L	H	H	L
V MUTE	O	SS-93P board IC001㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
A MUTE	O	SS-93P board IC001㉙	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
CAM PWR	O	SS-93P board IC001㊱	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H
RP PB MODE	O	SS-93P board IC001㊸	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
$\overline{\text{FE ON}}$	O	SS-93P board IC001㊹	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
TAPE2/$\overline{\text{TAPE1}}$	O	FP-53 board S301	"L" when using MP type tape.																
$\overline{\text{EDIT}}$	O	PA-24P board S990	"L" when EDIT switch (PA-24 board S990) is turuned ON.																
DATA TO SLAVE	O	FC-25P board IC101㊵	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CLK	O	FC-25P board IC101㊴	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CG STB	O	FC-25P board IC101㉜	L	L	L	L	L	L	L	L	L	L	L	L	L	*11	*11	*11	*11

* 1 Outputs identification results is PB mode immediately preceding. SP mode "H", LP mode "L".

* 2 Outputs identification results of playback tape recording mode (SP/LP). SP mode "H", LP mode "L".

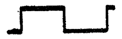
* 3 False VD signal (V cycle "H" pulse)

* 4 30Hz 50% duty pulse. Synchronized to drum rotation.

* 5 V cycle "L" pulse separated from line input video signal or camera video signal.

* 6 "H" at tape no signal portion or dropout portion. Input for head clogging detection.

* 9 V cyclse pulse.

*10 2V cyclse pulse. ().

*11 2V cyclse pulse series.

3-11. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	VTR MODE													CAMERA MODE			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REV	REC
						CUE	REVIEW		CUE	REVIEW									
ATF ERR	I	SS-93P board IC001②		* 1	* 1	* 2	* 2	* 2	* 2	* 2	* 2	* 2	* 2	* 1			* 2	* 2	* 1
SWP DLY * 3	I	SS-93P board IC001③																	
D PWM	O	SS-93P board IC001⑤	L	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4
C PWM	O	SS-93P board IC001⑥	L	* 5	* 5	* 5	* 5	* 5	* 5	* 5	L	* 5	* 5	* 5	L	L	* 5	* 5	* 5
D PG	I	SS-93P board IC001⑩	L	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6
RF SWP	O	SS-93P board IC001⑭	H/L	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7
REF V	I	SS-93P board IC001⑮	* 8	* 8	* 8	L	L	L	L	L	L	L	L	* 8	* 8	* 8	L	L	* 8
D FG	I	SS-93P board IC001⑰	H	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9
C FG	I	SS-93P board IC001⑱	H/L	*10	*10	*11	*12	*13	*11	*12	H/L	*14	*14	*13	H/L	H/L	*13	*13	*13
CAP ON	O	SS-93P board IC001㉝	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{ATF LOCK}}$	I	SS-93P board IC001㉞		H	H	H	H	L	H	H	H	H	H	H	H	H	L	L	H
$\overline{\text{TS B}}$	O	SS-93P board IC001㊳	H	H	H	H	H	*15	H	H	H	H	H	H	H	H	*15	*16	H
CAP BLK	O	SS-93P board IC001㊴	L	L	L	L	L	L	L	L	L	*17	*17	L	L	L	L	L	L
CAP FWD/$\overline{\text{RVS}}$	O	SS-93P board IC001㊵	H	H	L	H	L	H	H	L	H	H	H	H	H	H	H	L	H
SEL1	O	SS-93P board IC001㊺	L	L	L	*18	*19	*15	*18	*19	H	*20	*20	*21	L	L	*15	*16	*21
SEL2	O	SS-93P board IC001㊻	L	L	L	*18	*19	*15	*18	*19	H/L	*20	*20	*21	H	H	*15	*16	*21
SEL 16K/$\overline{\text{47K}}$	O	SS-93P board IC001㊼	L	L	L	*18	*19	*15	*18	*19	L	*20	*20	L	L	L	*15	*16	L
SLOW GAIN	O	SS-93P board IC001(56)	L	L	L	L	L	L	L	L	H	H	H	L	L	L	L	L	L

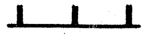
* 1 Fixed voltage approx. 2V DC.

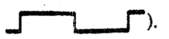
* 2 ATF error voltage.

* 3 DC voltage set by RV002 is input.

* 4 53μsec cycle PWM wave. Duty ratio changes according to drum error signal.

* 5 53μsec cycle PWM wave. Duty ratio changes according to capstan error signal.

* 6 V cycle "H" pulse. ()

* 7 30Hz 50% duty pulse (). Synchronized to drum rotation.

* 8 V cycle "L" pulse separated from line input video signal or camera video signal.

* 9 720Hz pulse

*10 Approx. 16500Hz pulse

*11 Approx. 5900Hz pulse (SP mode)

*12 Approx. 5600Hz pulse (SP mode)

*13 Approx. 826Hz pulse (SP mode)

*14 Pulse input during step-by-step.

*15 Refer to Timing Chart 1

*16 Refer to Timing Chart 2

*17 "H" pulse output during step-by-step

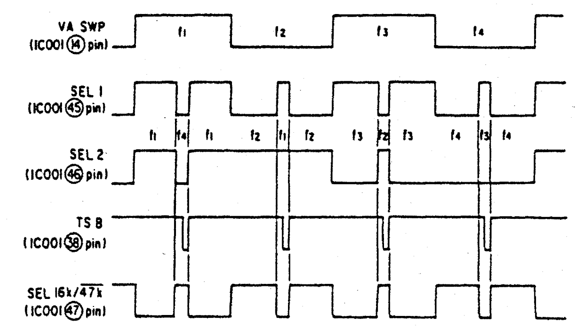
*18 Refer to Timing Chart 3

*19 Refer to Timing Chart 4

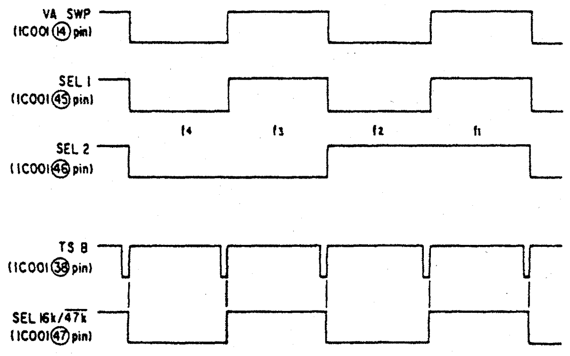
*20 Pulse output during step-by-step

*21 Refer to Timing Chart 5

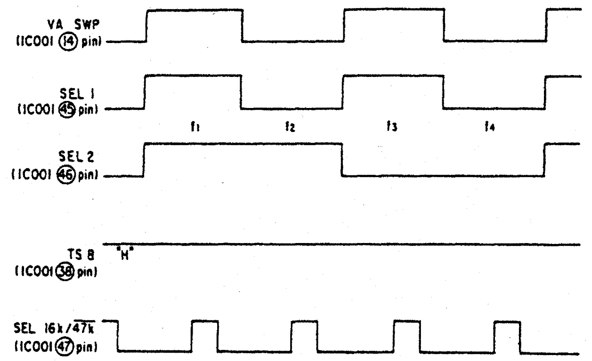
3-11-1. TIMING CHART 1 (PB, EDIT CUE)


VA SWP (IC001 ⑭ pin)
f1
f2
f3
f4
SEL 1 (IC001 ㊺ pin)
f1
f4
f1
f2
f1
f2
f3
f2
f3
f4
f3
f4
SEL 2 (IC001 ㊻ pin)
TS 8 (IC001 ㊳ pin)
SEL 16k/47k (IC001 ㊼ pin)

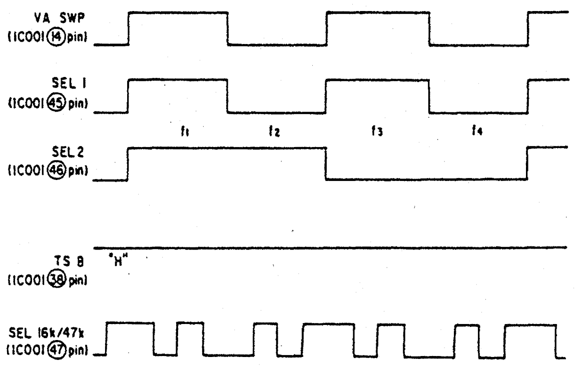
3-11-2. TIMING CHART 2 (EDIT REVIEW)


VA SWP (IC001 ⑭ pin)
SEL 1 (IC001 ㊺ pin)
f4
f3
f2
f1
SEL 2 (IC001 ㊻ pin)
TS 8 (IC001 ㊳ pin)
SEL 16k/47k (IC001 ㊼ pin)

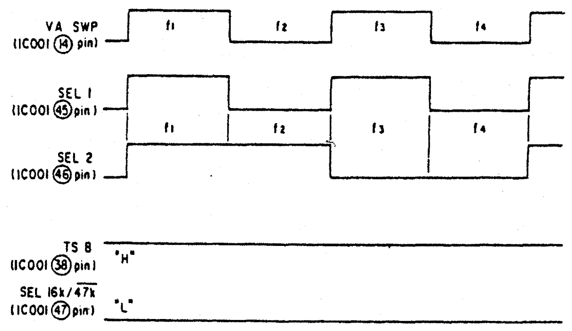
3-11-3. TIMING CHART 3 (CUE)


VA SWP (IC001 ⑭ pin)
SEL 1 (IC001 ㊺ pin)
f1
f2
f3
f4
SEL 2 (IC001 ㊻ pin)
TS 8 "H"
(IC001 ㊳ pin)
SEL 16k/47k (IC001 ㊼ pin)

3-11-4. TIMING CHART 4 (REVIEW)


VA SWP (IC001 ⑭ pin)
SEL 1 (IC001 ㊺ pin)
f1
f2
f3
f4
SEL 2 (IC001 ㊻ pin)
TS 8 "H"
(IC001 ㊳ pin)
SEL 16k/47k (IC001 ㊼ pin)

3-11-5. TIMING CHART 5 (REC)


VA SWP (IC001 ⑭ pin)
f1
f2
f3
f4
SEL 1 (IC001 ㊺ pin)
f1
f2
f3
f4
SEL 2 (IC001 ㊻ pin)
TS 8 (IC001 ㊳ pin) "H"
SEL 16k/47k (IC001 ㊼ pin) "L"

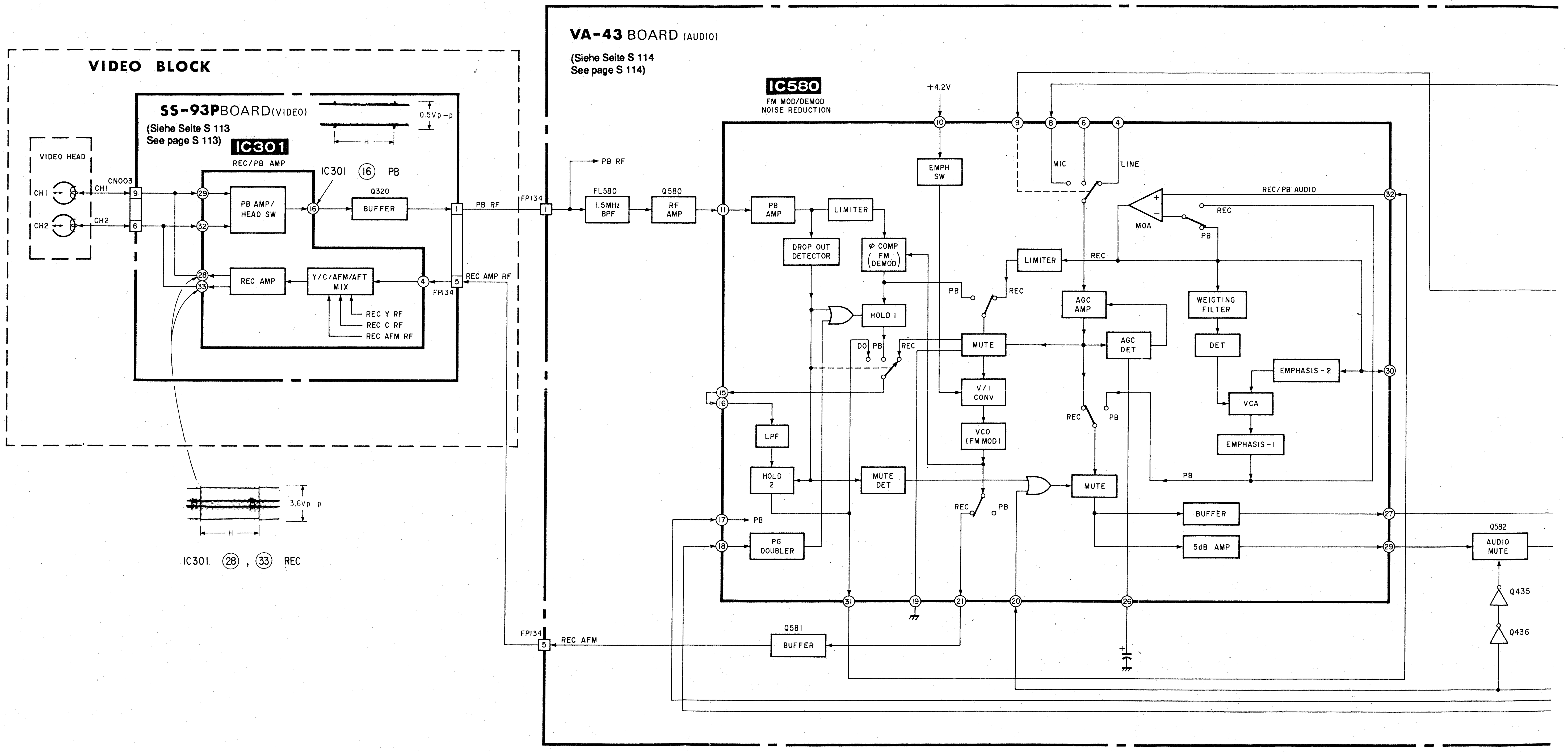
3-12. SYSTEM CONTROL—PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	Input/Output Level
DEW	I	SS-93P board IC001①	Dew sensor input. Input voltage increases when there is dew.
VA REF	I	SS-93P board IC001④	Reference voltage input (5V DC) for A-D conversion of pin ① (DEW), pin ② (ATF ERR) and pin ③ (SWP DLY) input analog voltage (0-5V DC).
CLK	I	SS-93P board IC001⑦	Clock input from serial data transmission mode control (FD-6P board IC151). V cycle "L" pulse ( ) in VTR mode.
DATA TO MASTER	O	SS-93P board IC001⑧	Serial data output to mode control. V cycle "L" pulse ( ) in VTR mode.
DATA TO SLAVE	I	SS-93P board IC001⑨	Serial data input from mode control. V cycle "L" pulse ( ) in VTR mode.
$\overline{\text{END SENS}}$	I	SS-93P board IC001⑲	TAPE END sensor (SS-93P board PH001) input. "L" pulse input at tape end. Normally "H".
$\overline{\text{TOP SENS}}$	I	SS-93P board IC001㉑	TAPE TOP sensor (SS-93P board PH002) input. "L" pulse input at tape top. Normally "H".
$\overline{\text{CS}}$	I	SS-93P board IC001㉒	Serial signal Chip select signal input from mode control. V cycle pulse. ( )
$\overline{\text{SLAVE RESET}}$	I	SS-93P board IC001㉓	Reset signal input from mode control. Goes "L" when power is turned ON/OFF and servo/mechanism control (SS-93P board IC001) is reset.
$\overline{\text{T/E LED}}$	O	SS-93P board IC001㉛	Pulse output ( ) for lighting up T/E SENS LED (FP-53 board D302). REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW "L" when LED is lit up. REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW 3msec cycle.
VTR POWER	O	SS-93P board IC001㉟	VTR power ON/OFF signal output. "H" during VTR mode and CAMERA mode. Operates DC-DC converter, and generates VTR 5V.
CAM POWER	O	SS-93P board IC001㊱	Camera power ON/OFF signal output. "H" during CAMERA mode. Operates DC-DC converter and generates voltages used for camera.
LOAD	O	SS-93P board IC001㊶	"H" during cassette loading.
UNLOAD	O	SS-93P board IC001㊷	"H" during cassette eject.
$\overline{\text{REC PROOF}}$	I	SS-93P board IC001㊾	"H" when cassette which can not be recorded (erase prevention) is inserted.
M SW1	I	SS-93P board IC001㊿	Mode switch input for mechanism. Indicates mechanism position.
M SW2	I	SS-93P board IC001(51)	
M SW3	I	SS-93P board IC001(52)	

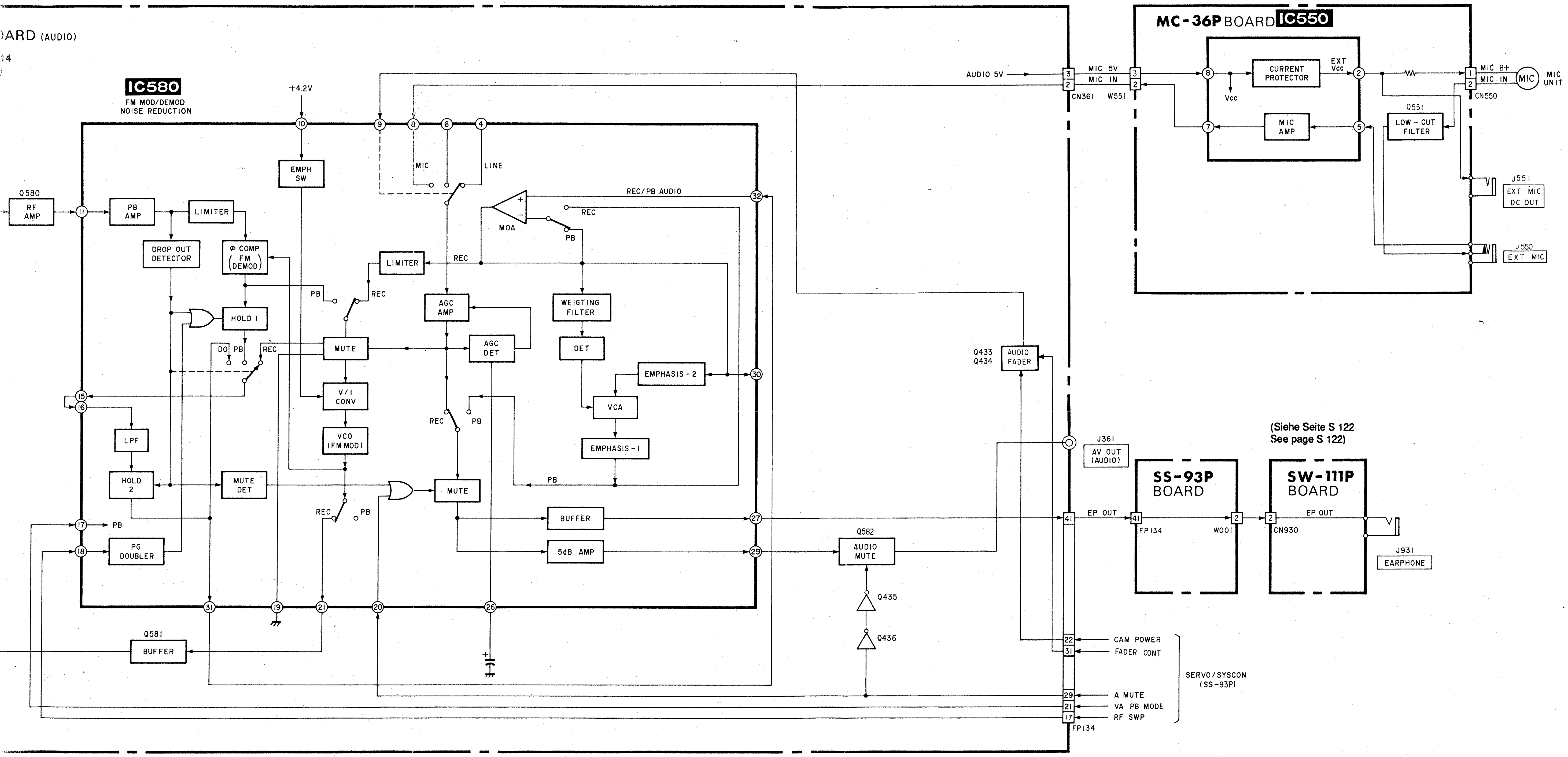
Mechanism position	READY	REC/PB/CUE/REV/FF/REW	GL	STOP	EJECT	Mid-position
M SW1	L	H	H	H	L	H
M SW2	H	H	L	L	L	H
M SW3	H	L	L	H	H	H

Signal	I/O	Pin No.	Input/Output Level
V SO	O	SS-93P board IC001(53)	Video serial data output.
BATTERY LEVEL	I	SS-93P board IC001(62)	Main battery voltage level detection input.
T REEL FG	I	SS-93P board IC001(63)	T REEL FG (FP-53 board D304) input. Pulse corresponds to S reel rotation.
S REEL FG	I	SS-93P board IC001(64)	S REEL FG (FP-53 board D303) input. Pulse corresponds to S reel rotation.

3-13. AUDIO BLOCK DIAGRAM

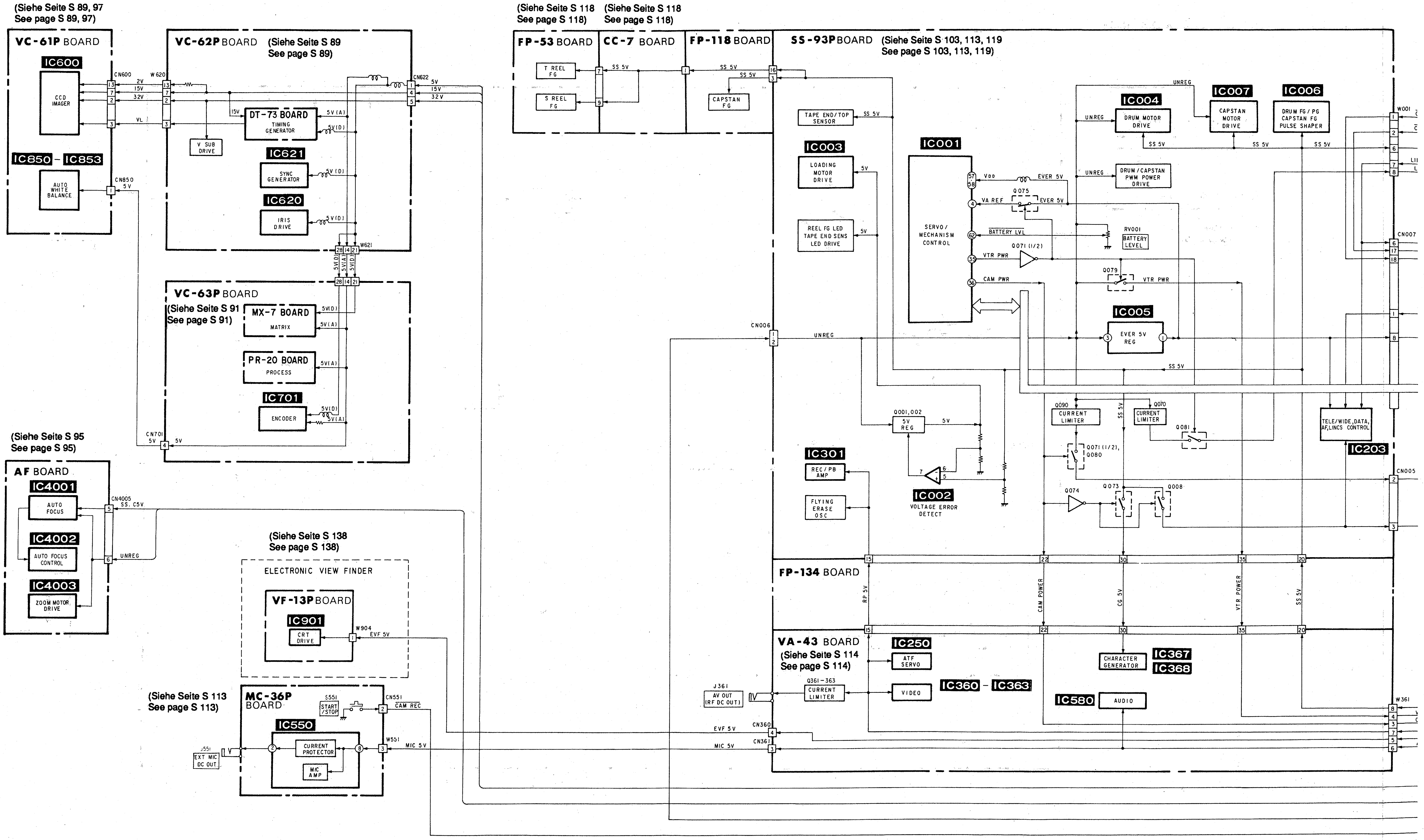

VIDEO BLOCK
SS-93P BOARD (VIDEO)
(Siehe Seite S 113
See page S 113)
IC301
REC/PB AMP
0.5Vp-p
H
VIDEO HEAD
CH1
CH2
CN003
PB AMP/
HEAD SW
IC301 ⑯ PB
Q320
BUFFER
PB RF
REC AMP
Y/C/AFM/AFT
MIX
REC Y RF
REC C RF
REC AFM RF
REC AMP RF
FP134
3.6Vp-p
IC301 ㉘, ㉝ REC
VA-43 BOARD (AUDIO)
(Siehe Seite S 114
See page S 114)
IC580
FM MOD/DEMOD
NOISE REDUCTION
+4.2V
PB RF
FL580
1.5MHz
BPF
Q580
RF
AMP
PB
AMP
LIMITER
DROP OUT
DETECTOR
φ COMP
(FM
DEMOD)
HOLD 1
DO
PB
REC
EMPH
SW
MIC
LINE
REC/PB AUDIO
MOA
REC
PB
LIMITER
REC
AGC
AMP
AGC
DET
WEIGTING
FILTER
DET
EMPHASIS-2
MUTE
V/I
CONV
VCO
(FM MOD)
VCA
EMPHASIS-1
LPF
HOLD
2
MUTE
DET
PG
DOUBLER
BUFFER
5dB AMP
Q582
AUDIO
MUTE
Q435
Q436
Q581
BUFFER
REC AFM

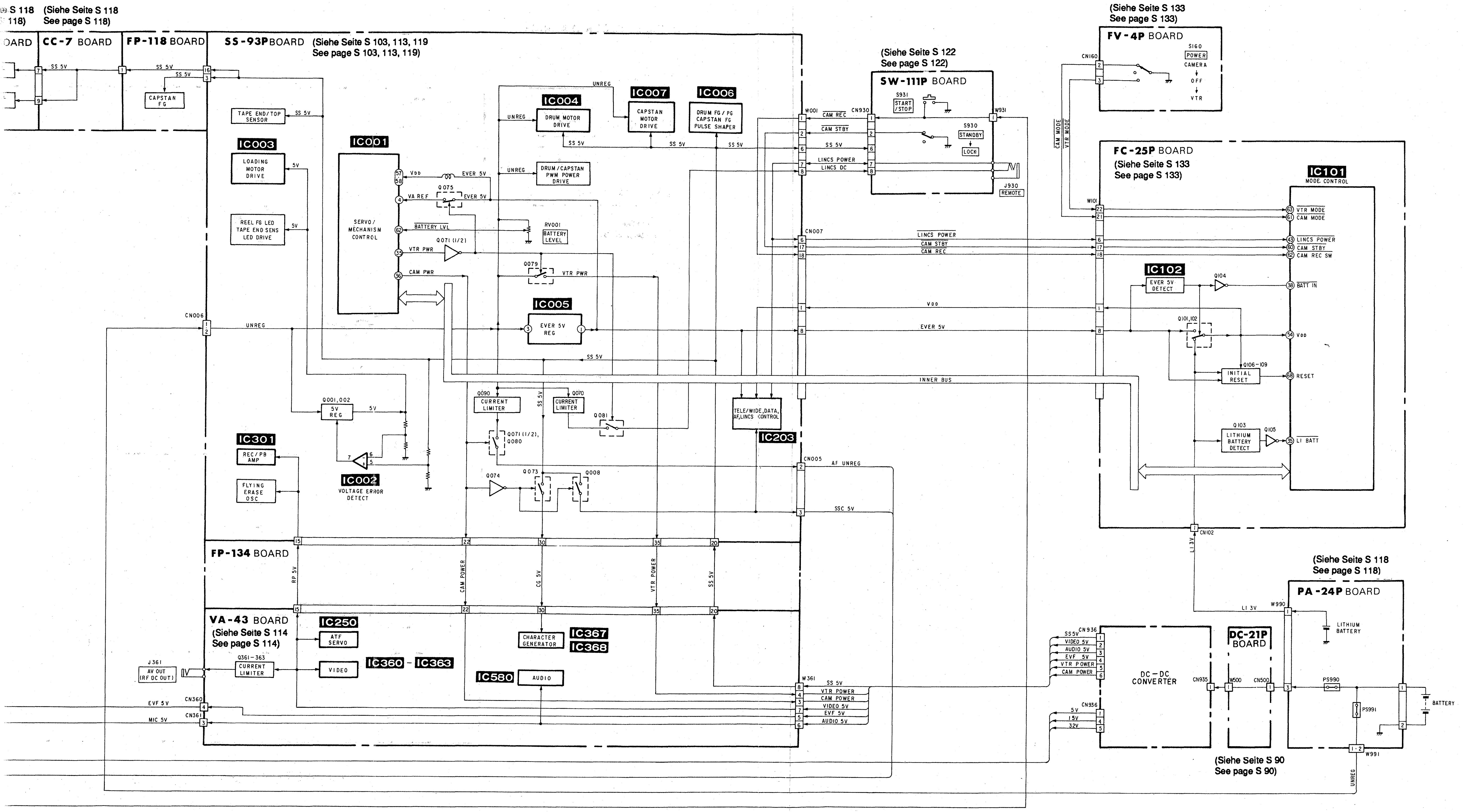
(Siehe Seite S 113
See page S 113)


ARD (AUDIO)
14
IC580
FM MOD/DEMOD
NOISE REDUCTION
+4.2V
Q580
RF AMP
PB AMP
LIMITER
DROP OUT DETECTOR
φ COMP (FM DEMOD)
HOLD I
DO PB REC
PB
REC
LIMITER
REC
EMPH SW
MIC
LINE
MOA
REC
PB
REC/PB AUDIO
AGC AMP
AGC DET
WEIGTING FILTER
DET
EMPHASIS - 2
VCA
EMPHASIS - I
MUTE
V/I CONV
VCO (FM MOD)
REC
PB
LPF
HOLD 2
MUTE DET
REC
PB
MUTE
PB
BUFFER
5dB AMP
PB
PG DOUBLER
Q581
BUFFER
Q582
AUDIO MUTE
Q435
Q436
Q433
Q434
AUDIO FADER
AUDIO 5V
MIC 5V
MIC IN
CN361
W551
MC-36P BOARD
IC550
CURRENT PROTECTOR
EXT Vcc
Vcc
MIC AMP
Q551
LOW-CUT FILTER
MIC B+
MIC IN
MIC
MIC UNIT
CN550
J551
EXT MIC DC OUT
J550
EXT MIC
J361
AV OUT (AUDIO)
EP OUT
SS-93P BOARD
FP134
W001
SW-111P BOARD
CN930
EP OUT
J931
EARPHONE
CAM POWER
FADER CONT
A MUTE
VA PB MODE
RF SWP
SERVO/SYSCON (SS-93P)
FP134

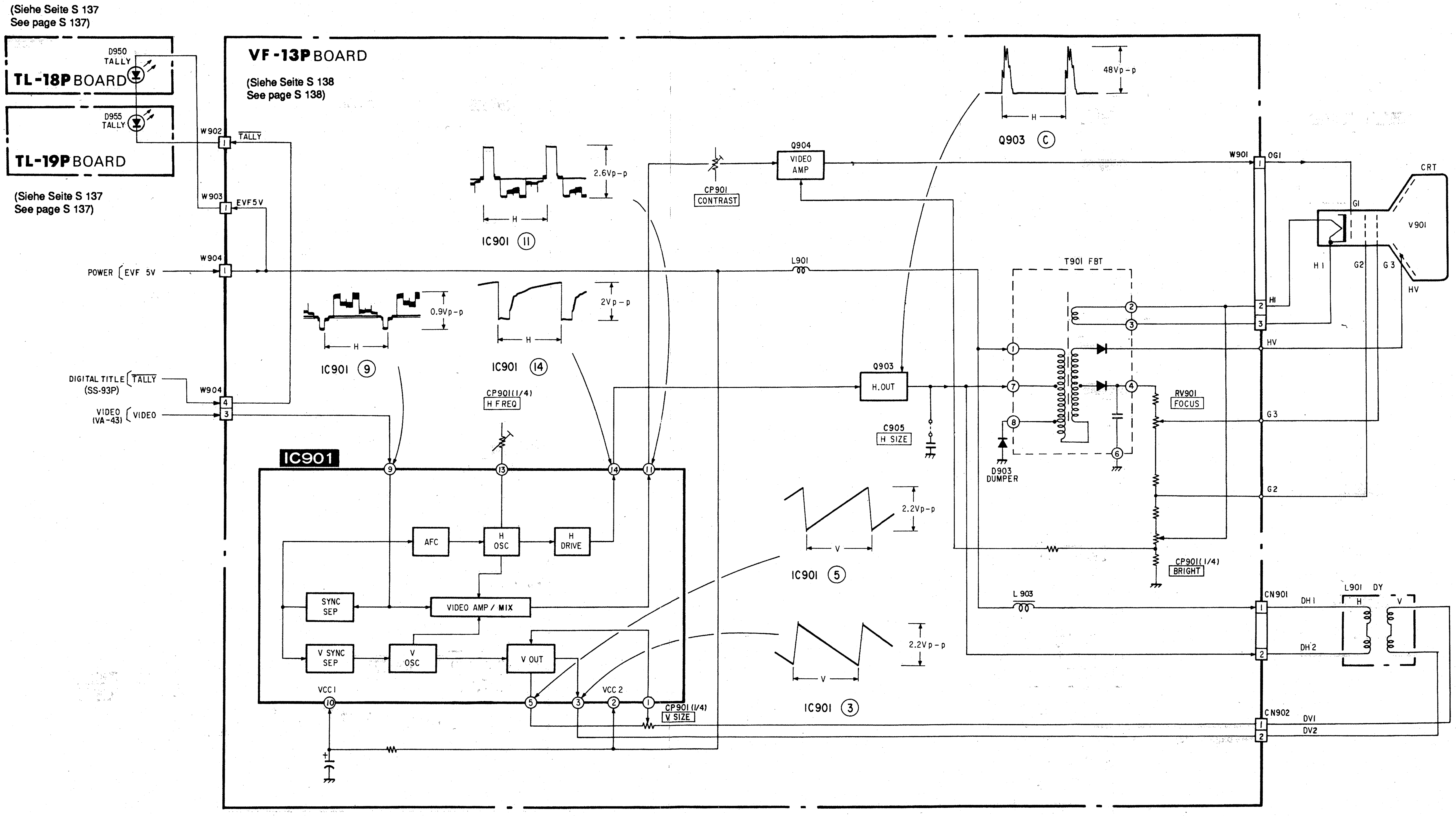
(Siehe Seite S 122
See page S 122)

3-14. POWER SUPPLY BLOCK DIAGRAM


(Siehe Seite S 89, 97
See page S 89, 97)
VC-61P BOARD
IC600
CCD IMAGER
IC850 - IC853
AUTO WHITE BALANCE
CN600
CN850 5V
W620
2V
15V
32V
VL
VC-62P BOARD (Siehe Seite S 89
See page S 89)
DT-73 BOARD
TIMING GENERATOR
V SUB DRIVE
IC621
SYNC GENERATOR
IC620
IRIS DRIVE
5V(A)
5V(D)
CN622
5V
15V
32V
W621
VC-63P BOARD
(Siehe Seite S 91
See page S 91)
MX-7 BOARD
MATRIX
PR-20 BOARD
PROCESS
IC701
ENCODER
CN701 5V
(Siehe Seite S 95
See page S 95)
AF BOARD
IC4001
AUTO FOCUS
IC4002
AUTO FOCUS CONTROL
IC4003
ZOOM MOTOR DRIVE
CN4005
SS. C5V
UNREG
(Siehe Seite S 138
See page S 138)
ELECTRONIC VIEW FINDER
VF-13P BOARD
IC901
CRT DRIVE
W904
EVF 5V
(Siehe Seite S 113
See page S 113)
MC-36P BOARD
S551 START/STOP
IC550
CURRENT PROTECTOR
MIC AMP
J551 EXT MIC DC OUT
CN551
CAM REC
W551
MIC 5V
(Siehe Seite S 118
See page S 118)
(Siehe Seite S 118
See page S 118)
FP-53 BOARD
T REEL FG
S REEL FG
CC-7 BOARD
FP-118 BOARD
CAPSTAN FG
SS 5V
SS-93P BOARD (Siehe Seite S 103, 113, 119
See page S 103, 113, 119)
TAPE END/TOP SENSOR
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/MECHANISM CONTROL
VDD
EVER 5V
Q075
VA REF
BATTERY LVL
Q071 (1/2)
VTR PWR
CAM PWR
RV001 BATTERY LEVEL
Q079
IC004
DRUM MOTOR DRIVE
DRUM/CAPSTAN PWM POWER DRIVE
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
UNREG
IC005
EVER 5V REG
CN006
Q001,002 5V REG
IC002
VOLTAGE ERROR DETECT
IC301
REC/PB AMP
FLYING ERASE OSC
Q090 CURRENT LIMITER
Q070 CURRENT LIMITER
Q081
Q071 (1/2), Q080
Q074
Q073
Q008
TELE/WIDE,DATA, AF,LINCS CONTROL
IC203
W001
CN007
CN005
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
SS 5V
VA-43 BOARD
(Siehe Seite S 114
See page S 114)
IC250
ATF SERVO
Q361-363 CURRENT LIMITER
VIDEO
IC360 - IC363
CHARACTER GENERATOR
IC367
IC368
IC580
AUDIO
J361 AV OUT (RF DC OUT)
EVF 5V
MIC 5V
CN360
CN361
W361

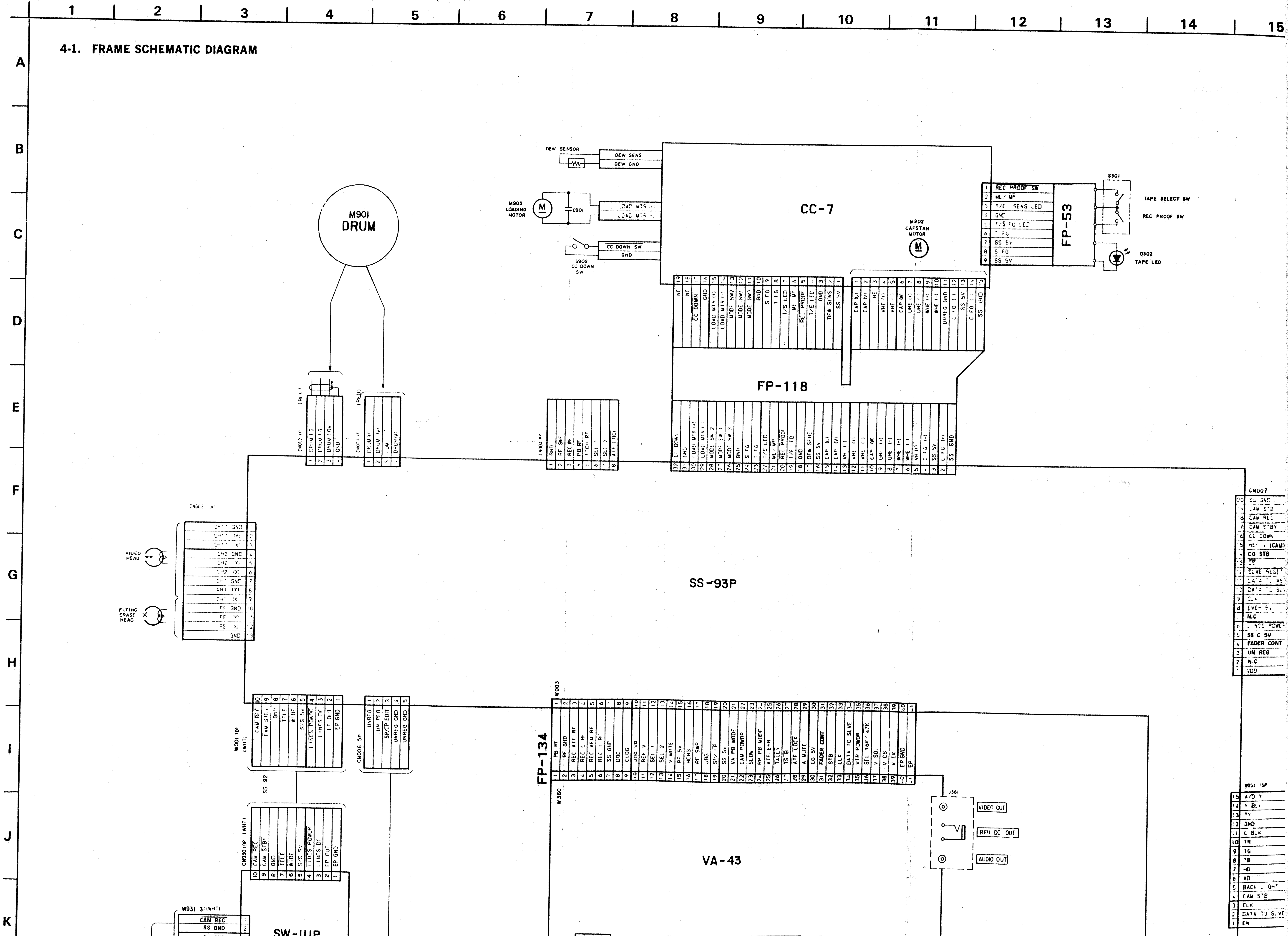

S 118 (Siehe Seite S 118
118) See page S 118)
CC-7 BOARD
FP-118 BOARD
SS-93P BOARD (Siehe Seite S 103, 113, 119
See page S 103, 113, 119)
SS 5V
CAPSTAN FG
TAPE END/TOP SENSOR
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/ MECHANISM CONTROL
VDD
EVER 5V
VA REF
Q075
BATTERY LVL
RV001
BATTERY LEVEL
Q071 (1/2)
VTR PWR
CAM PWR
Q079
UNREG
IC004
DRUM MOTOR DRIVE
DRUM/CAPSTAN PWM POWER DRIVE
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
IC005
EVER 5V REG
CN006
Q001,002
5V REG
IC002
VOLTAGE ERROR DETECT
IC301
REC/PB AMP
FLYING ERASE OSC
Q090
CURRENT LIMITER
Q070
CURRENT LIMITER
Q081
Q071 (1/2), Q080
Q074
Q073
Q008
TELE/WIDE,DATA, AF,LINCS CONTROL
IC203
CN005
AF UNREG
SSC 5V
INNER BUS
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
VA-43 BOARD
(Siehe Seite S 114
See page S 114)
IC250
ATF SERVO
VIDEO
IC360 - IC363
CHARACTER GENERATOR
IC367
IC368
IC580
AUDIO
J361
AV OUT (RF DC OUT)
Q361-363
CURRENT LIMITER
EVF 5V
MIC 5V
CN360
CN361
W361
VTR POWER
VIDEO 5V
AUDIO 5V
(Siehe Seite S 122
See page S 122)
SW-111P BOARD
S931
START/STOP
S930
STANDBY
LOCK
W001
CN930
W931
CAM REC
CAM STBY
LINCS POWER
LINCS DC
J930
REMOTE
CN007
(Siehe Seite S 133
See page S 133)
FV-4P BOARD
CN160
S160
POWER
CAMERA
OFF
VTR
CAM MODE
VTR MODE
FC-25P BOARD
(Siehe Seite S 133
See page S 133)
IC101
MODE CONTROL
W101
CAM REC SW
IC102
EVER 5V DETECT
Q104
BATT IN
Q101,102
Q106-109
INITIAL RESET
RESET
Q103
LITHIUM BATTERY DETECT
Q105
LI BATT
CN102
LI 3V
(Siehe Seite S 118
See page S 118)
PA-24P BOARD
W990
LITHIUM BATTERY
CN936
SS5V
EVF 5V
DC-DC CONVERTER
CN935
DC-21P BOARD
W500
CN500
PS990
PS991
BATTERY
W991
15V
32V
(Siehe Seite S 90
See page S 90)

3-15. VIEWFINDER BLOCK DIAGRAM


(Siehe Seite S 137
See page S 137)
D950
TALLY
TL-18P BOARD
D955
TALLY
TL-19P BOARD
(Siehe Seite S 137
See page S 137)
VF-13P BOARD
(Siehe Seite S 138
See page S 138)
W902
TALLY
W903
EVF5V
W904
POWER
EVF 5V
DIGITAL TITLE
TALLY
(SS-93P)
W904
VIDEO
(VA-43)
VIDEO
2.6Vp-p
H
IC901 ⑪
0.9Vp-p
H
IC901 ⑨
2Vp-p
H
IC901 ⑭
CP901(1/4)
H FREQ
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP / MIX
V SYNC SEP
V OSC
V OUT
VCC 1
VCC 2
CP901 (1/4)
V SIZE
CP901
CONTRAST
Q904
VIDEO AMP
48Vp-p
H
Q903 Ⓒ
L901
Q903
H.OUT
C905
H SIZE
T901 FBT
D903
DUMPER
RV901
FOCUS
CP901(1/4)
BRIGHT
2.2Vp-p
V
IC901 ⑤
2.2Vp-p
V
IC901 ③
L903
W901
OG1
HI
HV
G3
G2
CRT
G1
V901
H1
G2
G3
HV
CN901
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM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7
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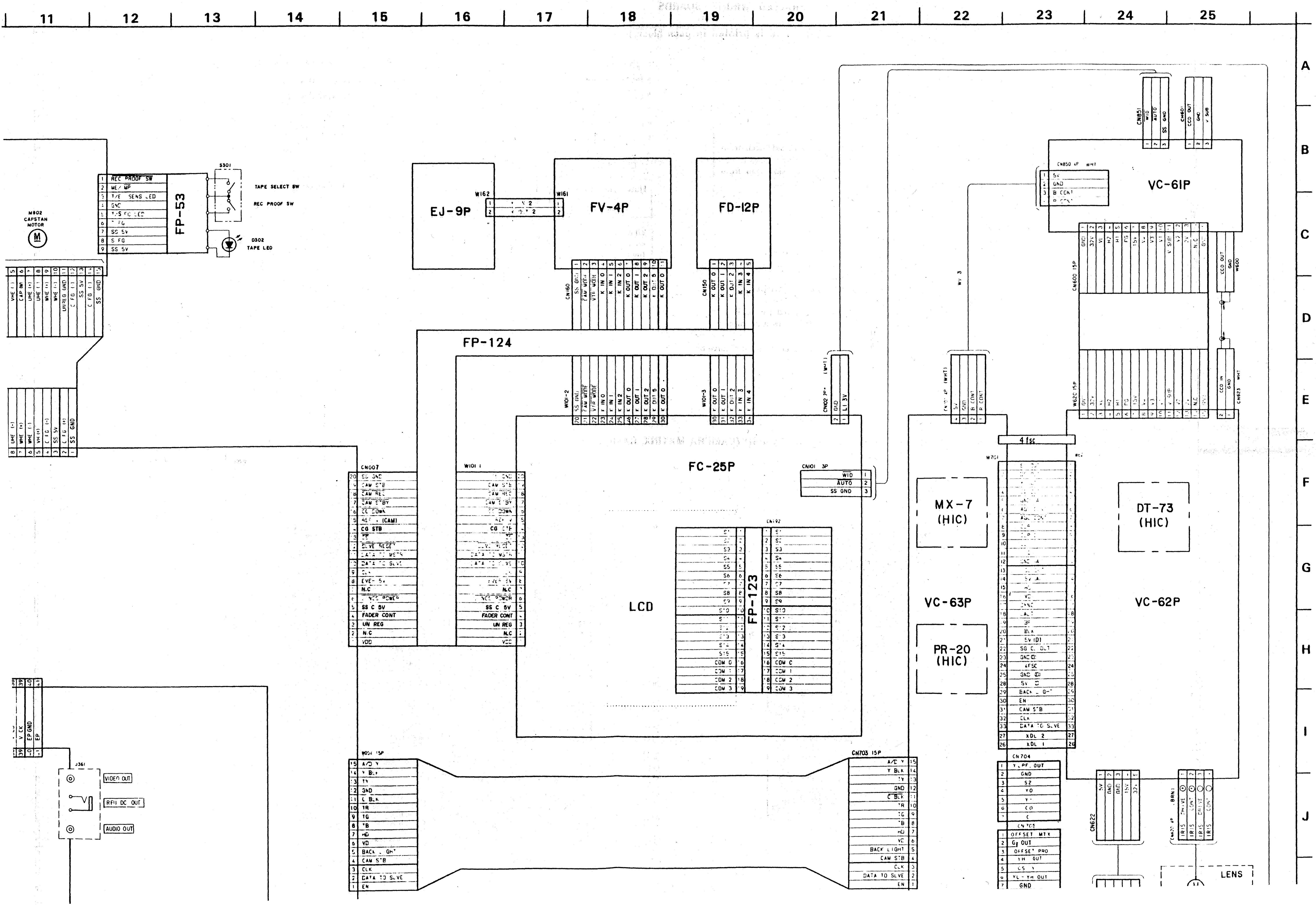
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
M901
DRUM
DEW SENSOR
DEW SENS
DEW GND
M903
LOADING
MOTOR
C901
LOAD MTR (+)
LOAD MTR (-)
S902
CC DOWN
SW
CC DOWN SW
GND
CC-7
M902
CAPSTAN
MOTOR
REC PROOF SW
ME/MP
T/E SENS LED
GND
T/S FG LED
T FG
SS 5V
S FG
SS 5V
FP-53
S301
TAPE SELECT SW
REC PROOF SW
D302
TAPE LED
FP-118
SS-93P
VIDEO HEAD
FLYING ERASE HEAD
CN003
CN004
CN007
FP-134
W003
W360
W001
SS 92
CN006
CN930
W931
SW-11P
VA-43
J361
VIDEO OUT
RFU DC OUT
AUDIO OUT
W004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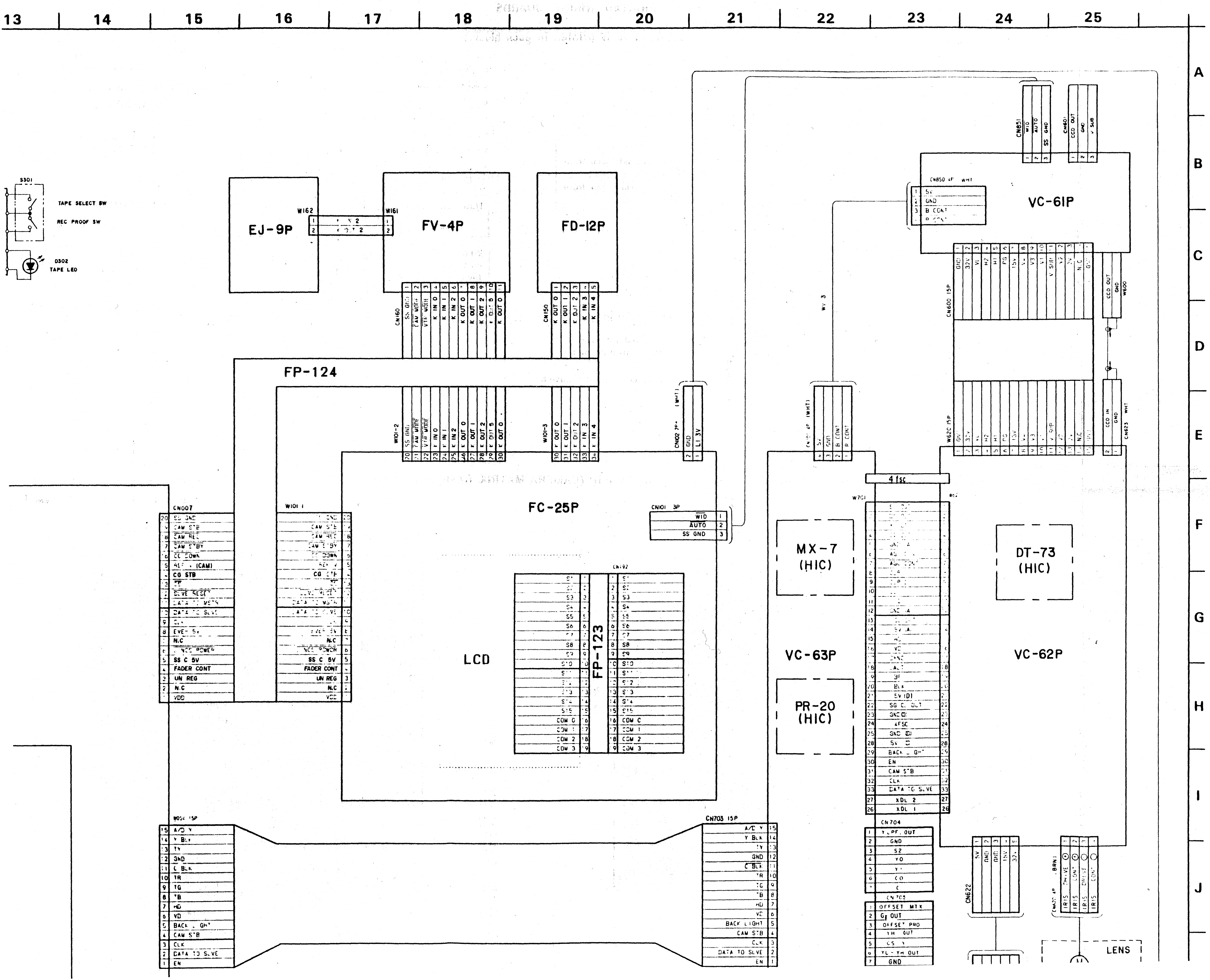
23
24
25
A
B
C
D
E
F
G
H
I
J
M902 CAPSTAN MOTOR
FP-53
REC PROOF SW
S301
TAPE SELECT SW
REC PROOF SW
D302 TAPE LED
EJ-9P
W162
W161
FV-4P
FD-12P
CN160
CN150
FP-124
W101-2
W101-3
CN102 2P (WHT)
FC-25P
CN101 3P
WID
AUTO
SS GND
CN007
W101 1
LCD
FP-123
CN192
MX-7 (HIC)
VC-63P
PR-20 (HIC)
4 fsc
W701
VC-62P
DT-73 (HIC)
VC-61P
CN850 4P WHT
CN851
CN601
CN600 15P
W600
CN620 15P
CN623
CN704
CN705
CN622
CN621 4P
LENS
J361
VIDEO OUT
RFU DC OUT
AUDIO OUT
W054 15P
CN703 15P
A/D Y
Y BLK
TY
GND
C BLK
TR
TG
TB
HD
VD
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
SS GND
CAM STB
CAM REC
CAM STBY
CG DOWN
CG STB
SLVE SELECT
DATA TO MSTR
DATA TO SLVE
EVER 5V
N.C
VCC POWER
SS C 5V
FADER CONT
UN REG
VDD
VCC
COM 0
COM 1
COM 2
COM 3
COM C
OFFSET MTX
OFFSET PRO
IRIS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A
B
C
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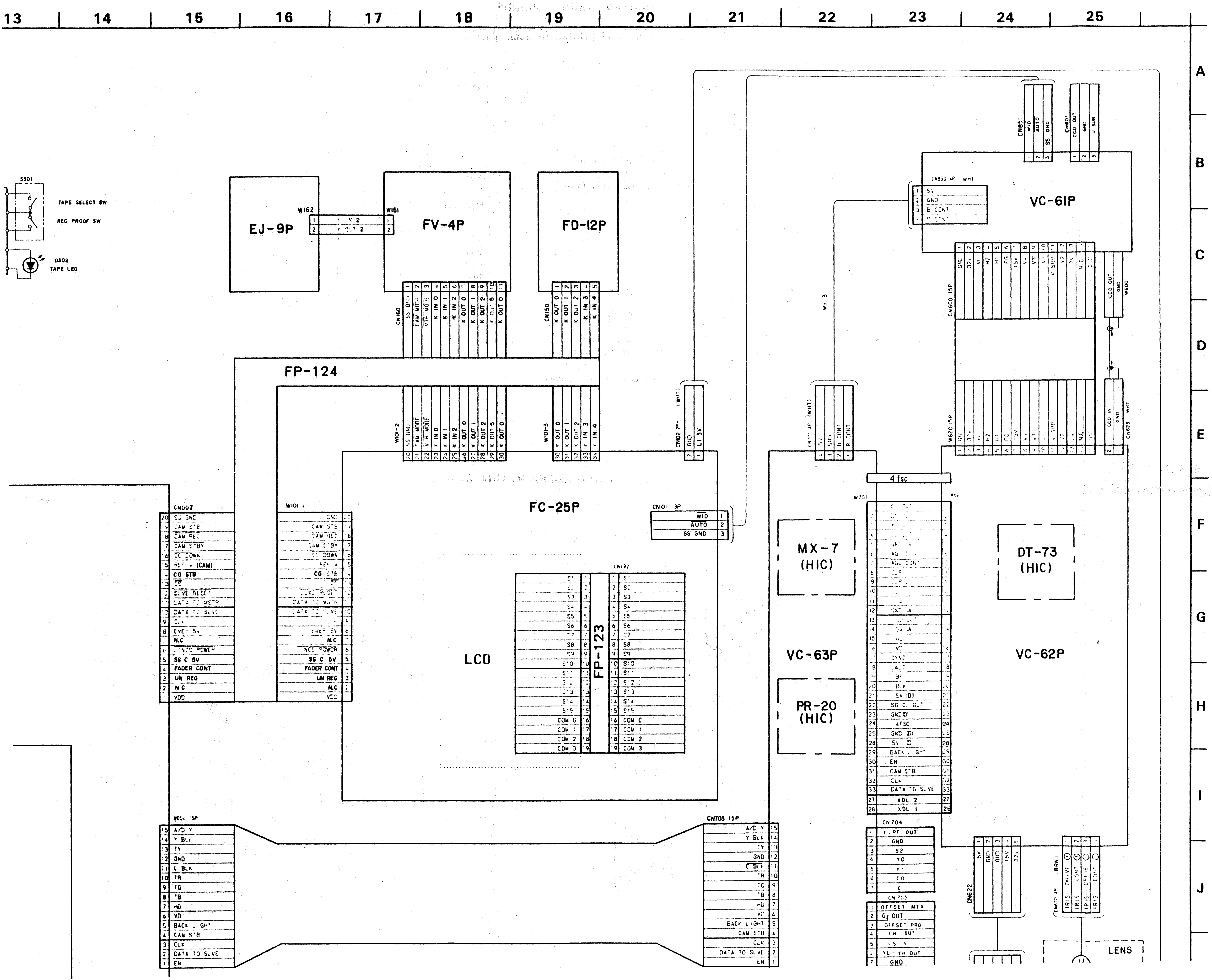
F
G
H
I
J
S301
TAPE SELECT SW
REC PROOF SW
D302
TAPE LED
EJ-9P
W162
W161
FV-4P
FD-12P
CN160
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
CN150
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
FP-124
W101-2
W101-3
CN102 2P (WHT)
GND
LI 3V
CN101 4P (WHT)
5V
GND
B CONT
R CONT
W/ 3
CN850 4P WHT
5V
GND
B CONT
R CONT
CN851
WID
AUTO
SS GND
CN601
CCD OUT
GND
V SUB
VC-61P
CN600 15P
GND
32V
V1
V3
H2
H1
PG
15V
V2
V SUB
N.C
W600
CCD OUT
GND
W620 15P
CN623
CCD IN
GND
WHT
CN007
20 SS GND
19 CAM STB
18 CAM REC
17 CAM STBY
16 CC DOWN
15 REF V (CAM)
14 CG STB
13
12 SLVE RESET
11 DATA TO MSTR
10 DATA TO SLVE
9 CLK
8 EVER 5V
7 N.C
6 NCS POWER
5 SS C 5V
4 FADER CONT
3 UN REG
2 N.C
1 VDD
W101-1
FC-25P
CN101 3P
WID 1
AUTO 2
SS GND 3
LCD
FP-123
CN192
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
COM 0
COM 1
COM 2
COM 3
W004 15P
15 A/D Y
14 Y BLK
13 TY
12 GND
11 C BLK
10 TR
9 TG
8 TB
7 HD
6 VD
5 BACK LIGHT
4 CAM STB
3 CLK
2 DATA TO SLVE
1 EN
CN703 15P
MX-7 (HIC)
PR-20 (HIC)
VC-63P
4 fsc
W701
W702
5 GND A
6 AGC
7 AGC CONT
12 GND A
14 5V A
15 HD
16 VD
17 SYNC
18 ALT
19 BF
20 BLK
21 5V (D)
22 SG CL OUT
23 GND (D)
24 4FSC
25 GND (D)
28 5V (D)
29 BACK LIGHT
30 EN
31 CAM STB
32 CLK
33 DATA TO SLVE
27 XDL 2
26 XDL 1
CN704
1 Y LPF. OUT
2 GND
3 S2
4 YO
5 Y1
6 CO
7 C
CN705
1 OFFSET MTX
2 GY OUT
3 OFFSET PRO
4 YH OUT
5 CS Y
6 YL - YH OUT
7 GND
DT-73 (HIC)
VC-62P
CN622
5V
GND
GND
15V
32V
CN620 4P (BRN)
IRIS DRIVE
IRIS CONT
IRIS DRIVE
IRIS CONT
LENS
M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A
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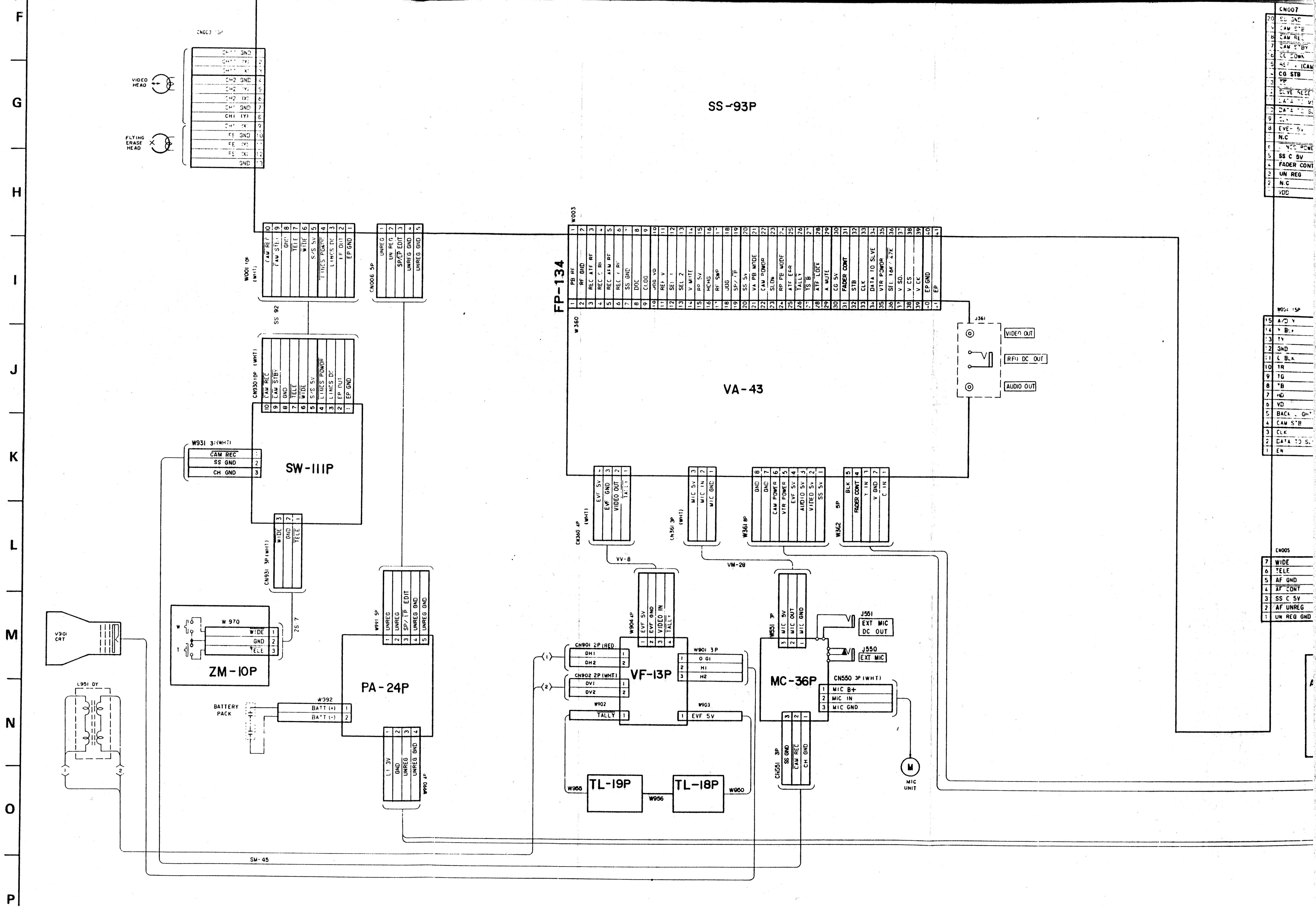
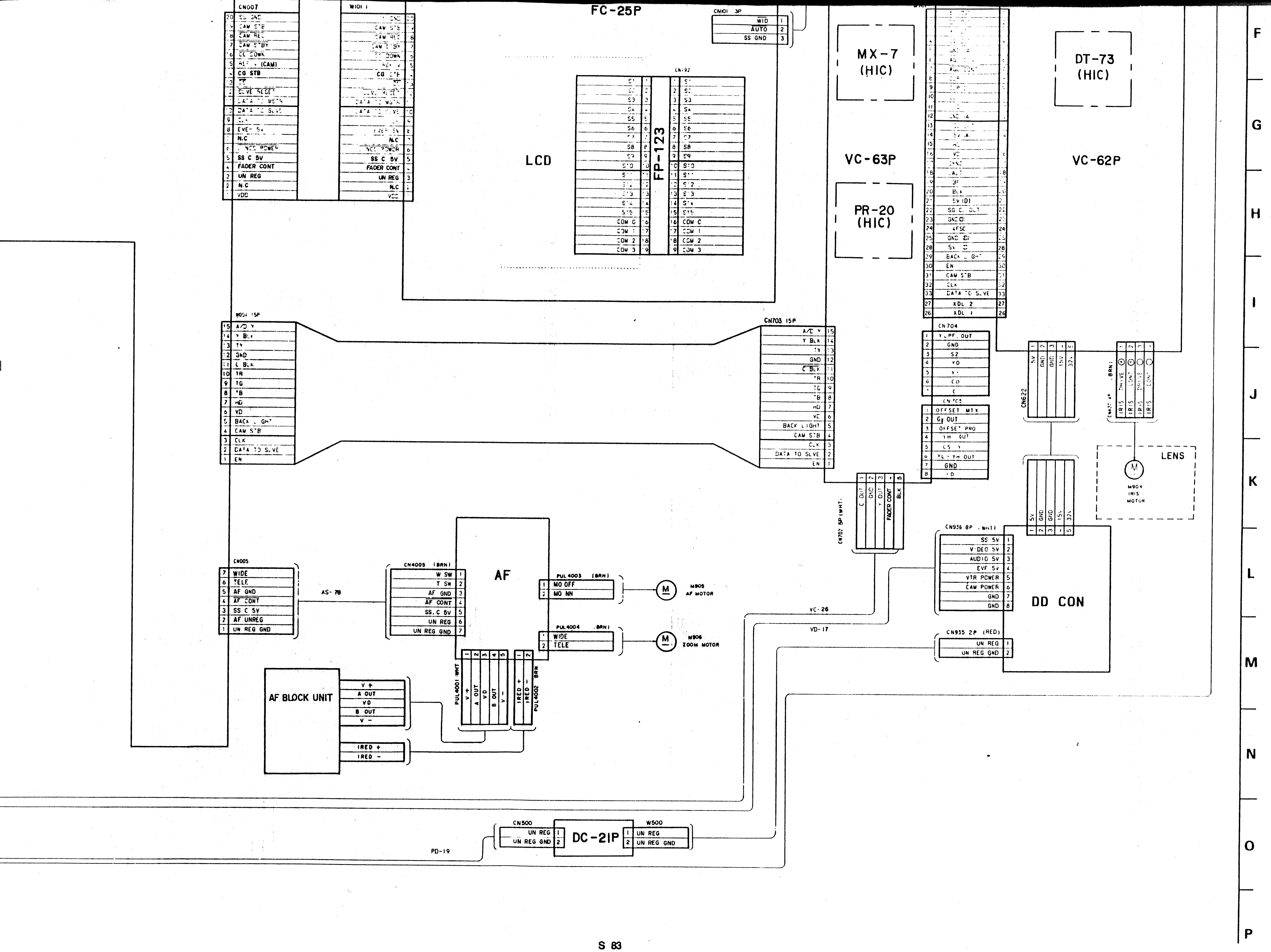
C
D
E
F
G
H
I
J
S301
TAPE SELECT SW
REC PROOF SW
D302
TAPE LED
EJ-9P
W162
W161
FV-4P
FD-12P
CN160
CN150
FP-124
W101-2
W101-3
CN102 2P (WHT)
L1 3V
GND
FC-25P
CN101 3P
WID
AUTO
SS GND
CN007
W101 1
LCD
FP-123
CN192
VC-63P
MX-7 (HIC)
PR-20 (HIC)
W701
4 fsc
VC-62P
DT-73 (HIC)
VC-61P
CN850 4P WHT
5V
GND
B CONT
R CONT
CN851
CN601
CCD OUT
GND
V SUB
CN600 15P
W600
W620 15P
CN623 WHT
CCD IN
W703
CN704
CN705
CN703 15P
W004 15P
A/D Y
Y BLK
GND
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
CN622
CN620 4P (BRN)
IRIS
LENS

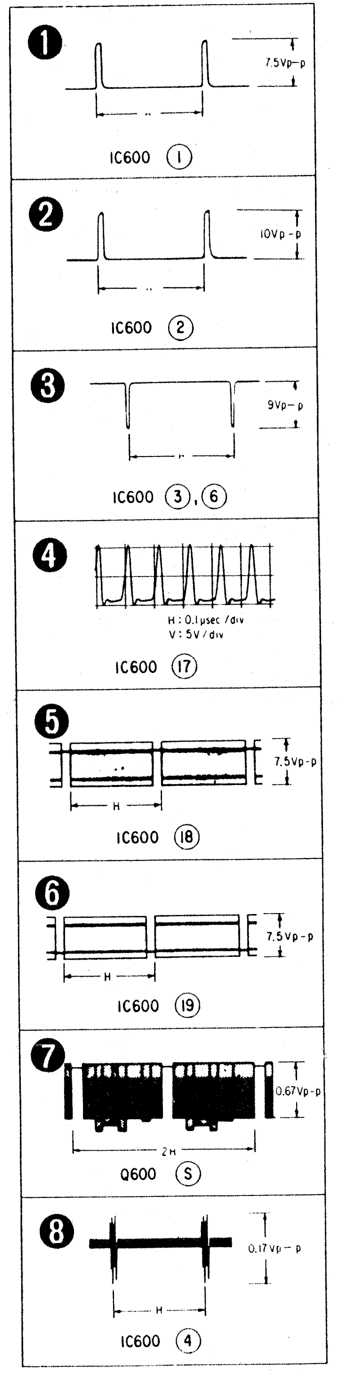


F
G
H
I
J
K
L
M
N
O
P
SS-93P
FP-134
VA-43
SW-111P
ZM-10P
PA-24P
VF-13P
MC-36P
TL-19P
TL-18P
VIDEO HEAD
FLYING ERASE HEAD
CH1 GND
CH2 GND
FE GND
GND
W001 10P (WHT)
CAM REC
CAM STBY
GND
TELE
WIDE
S/S 5V
LINCS POWER
LINCS DC
EP OUT
EP GND
CN006 5P
UNREG
UN REG
SP/LP EDIT
UNREG GND
SS 92
CN930 10P (WHT)
W003
W360
PB RF
RF GND
REC ATF RF
SS GND
DOC
CLOG
SEL 1
SEL 2
V MUTE
PP 5V
RF SWP
JUG
SP/LP
SS 5V
VA PB MODE
CAM POWER
SLOW
RP PB MODE
ATF ERR
TALLY
TS B
ATF LOCK
A MUTE
CG 5V
FADER CONT
STB
CLK
DATA TO SLVE
VTR POWER
V SO
V CS
V CK
EP
J361
VIDEO OUT
RFU DC OUT
AUDIO OUT
W931 3P (WHT)
CAM REC
SS GND
CH GND
CN931 3P (WHT)
W 970
WIDE
GND
TELE
W
T
ZS 7
W991 5P
V901 CRT
L951 DY
BATTERY PACK
W992
BATT (+)
BATT (-)
L1 3V
GND
UNREG
UNREG GND
W990 4P
CN360 4P (WHT)
EVF 5V
EVF GND
VIDEO OUT
TALLY
VV-8
CN361 3P (WHT)
MIC 5V
MIC IN
MIC GND
VM-28
W361 8P
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
W362 5P
BLK
FADER CONT
Y IN
V GND
C IN
W904 4P
EVF 5V
EVF GND
VIDEO IN
TALLY
CN901 2P (RED)
DH1
DH2
CN902 2P (WHT)
DV1
DV2
W901 3P
O GI
H1
H2
W902
TALLY
W903
EVF 5V
W955
W956
W950
W551 3P
MIC 5V
MIC OUT
MIC GND
J551
EXT MIC DC OUT
J550
EXT MIC
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
CN551 3P
SS GND
CAM REC
CH GND
M
MIC UNIT
SM-45
CN007
SS GND
CAM REC
CAM STBY
CG STB
N.C
SS C 5V
FADER CONT
UN REG
VDD
W004 15P
CLK
EN
CN005
WIDE
TELE
AF GND
AF CONT
SS C 5V
AF UNREG
UN REG GND

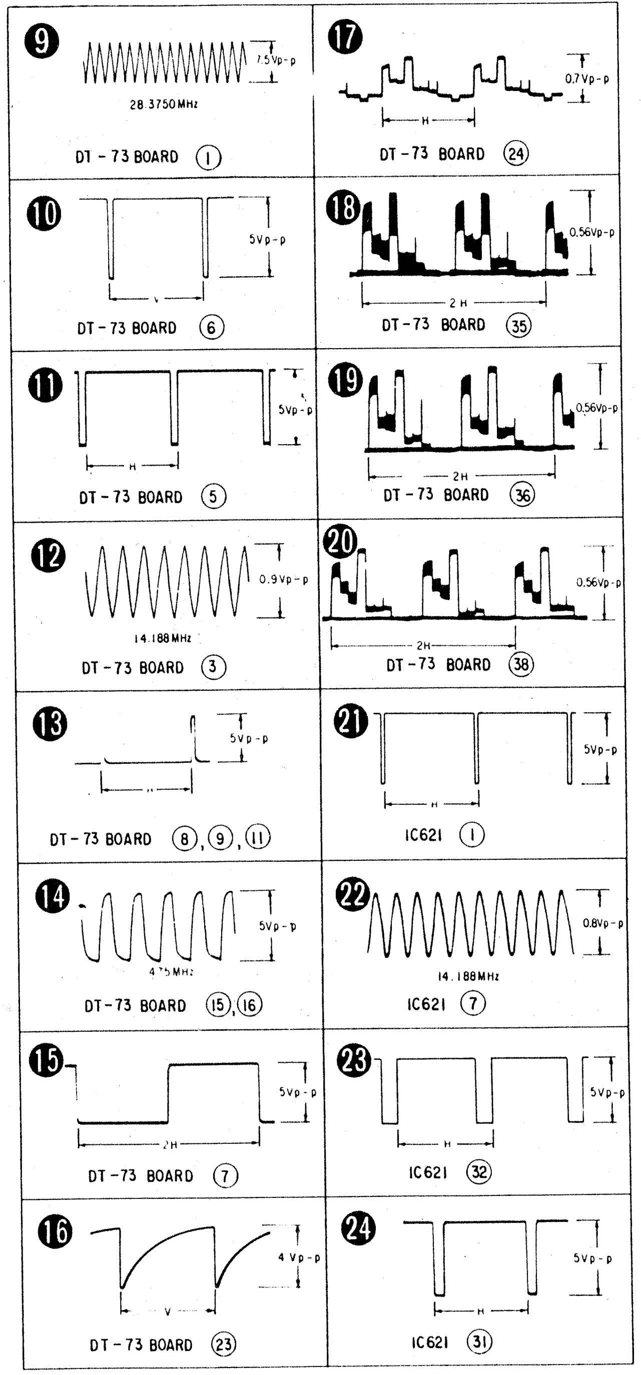

FC-25P
CN007
W101
CN101 3P
WID
AUTO
SS GND
LCD
FP-123
MX-7 (HIC)
VC-63P
PR-20 (HIC)
DT-73 (HIC)
VC-62P
W004 15P
CN703 15P
A/D Y
Y BLK
TY
GND
C BLK
TR
TG
TB
HD
VD
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
CN704
CN705
CN622
LENS
M904 IRIS MOTOR
CN702 5P (WHT)
C OUT
GND
Y OUT
FADER CONT
BLK
CN936 8P (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
DD CON
CN935 2P (RED)
UN REG
UN REG GND
CN005
WIDE
TELE
AF GND
AF CONT
SS C 5V
AF UNREG
UN REG GND
AS-78
CN4005 (BRN)
W SW
T SW
AF GND
AF CONT
SS. C 5V
UN REG
UN REG GND
AF
PUL4003 (BRN)
MO OFF
MO NN
M905 AF MOTOR
PUL4004 (BRN)
WIDE
TELE
M906 ZOOM MOTOR
PUL4001 WHT
PUL4002 BRN
AF BLOCK UNIT
V +
A OUT
VD
B OUT
V −
IRED +
IRED −
VC-26
VD-17
CN500
DC-21P
W500
PD-19
F
G
H
I
J
K
L
M
N
O
P

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

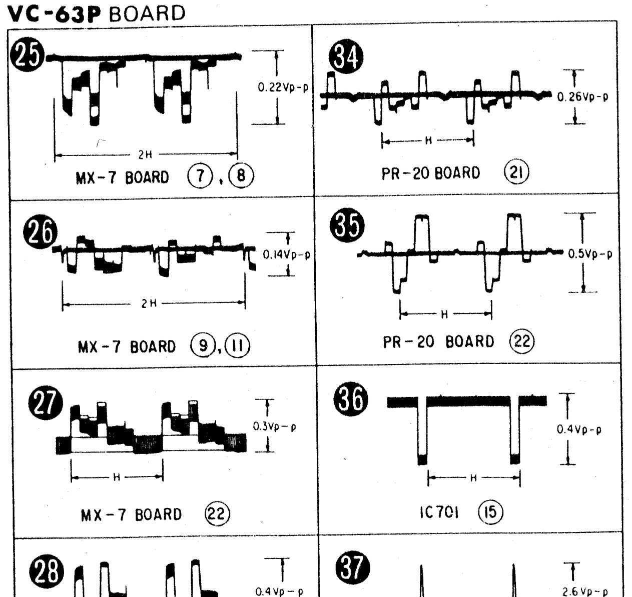
VC-61P BOARD



VC-62P BOARD



VC-63P BOARD



D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- Circled numbers refer to waveforms.

> **Caution:**
> Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
> Parts face side: (Component Side) Parts on the parts face side seen from the pattern face are indicated.

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair.
- ━ : B + Line
- ⇨ : IN/OUT direction of (+, –) B line.
- Circled numbers refer to waveforms.

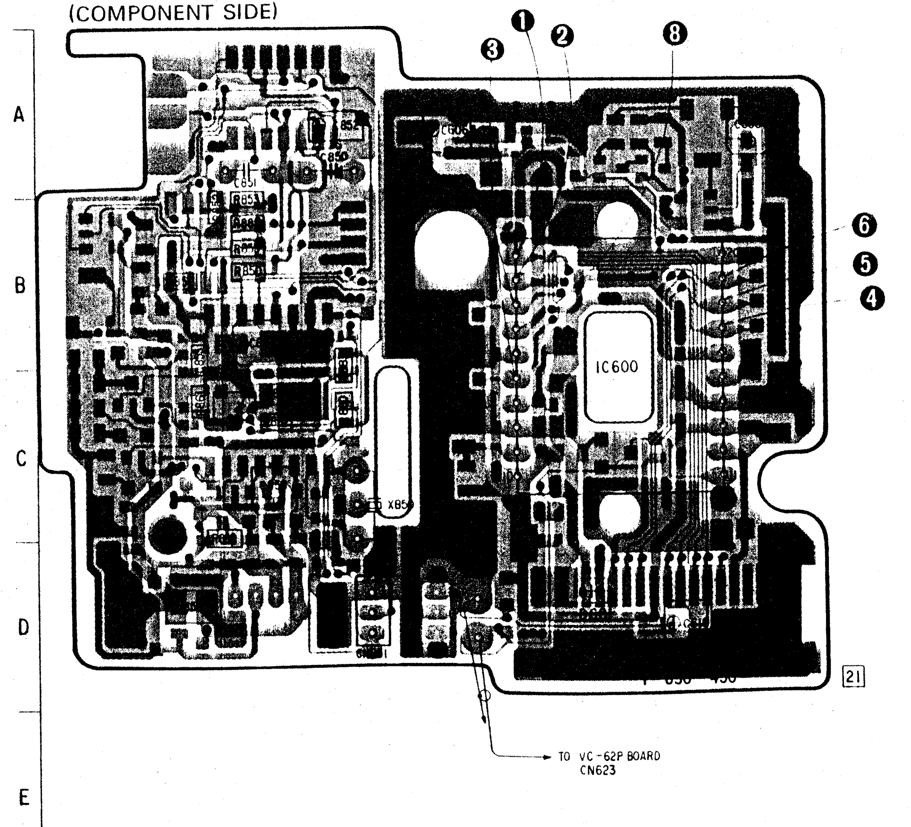
> **Note:** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
> Replace only with part number specified.

> When indicating parts by reference number, please include the board name.

VC-61P (CCD IMAGER), VC-62P (TIMING/SYNC GENERATOR), VC-63P (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21P (RELAY) PRI

—Ref. No. VC-61P, VC-62P, VC-63P, DC-21P BOARDS ; 1,000 series—

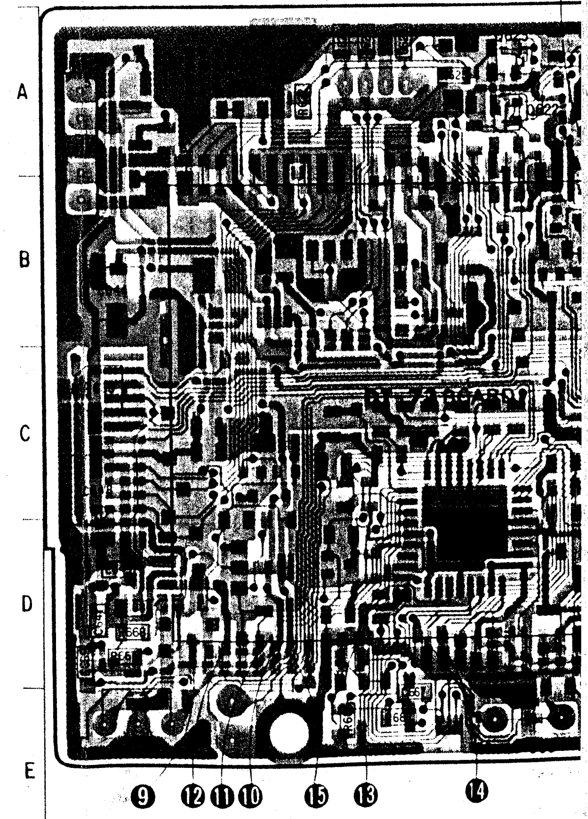
VC-61P BOARD
(COMPONENT SIDE)



VC-61P BOARD

VC-62P BOARD
(COMPONENT SIDE)

D623	G-1
D624	G-2
D625	F-3
D626	I-3
IC620	I-2
IC621	H-3
Q620	J-4
Q621	J-4
Q622	A-3
Q623	A-3
Q624	H-4
Q625	I-4
Q626	I-4
Q627	C-5
Q628	I-4
Q629	G-1
Q630	G-2
Q631	H-2
Q632	H-2
Q633	G-2
Q634	F-4



or dotted

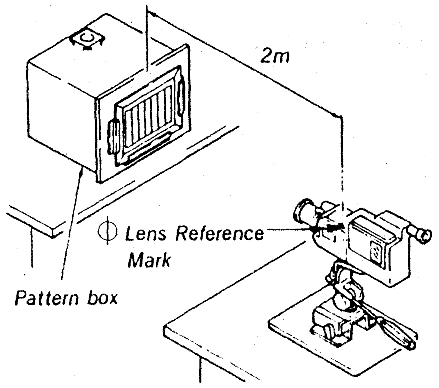
- **For voltage and waveforms.**

CAMERA (1), CAMERA (2), AUTO FOCUS, CAMERA (3) BLOCKS

- Voltage and waveform measuring conditions:

(1) Sample object : Pattern box color bars.
(2) Voltage values : Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Φ Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

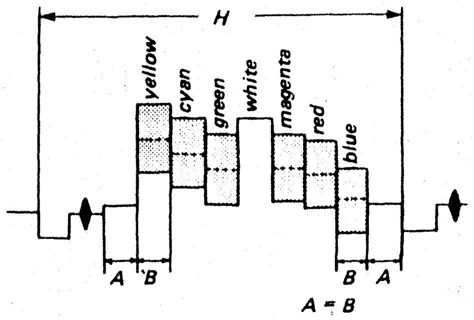

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Camera output waveform of J361 on VA-43 board

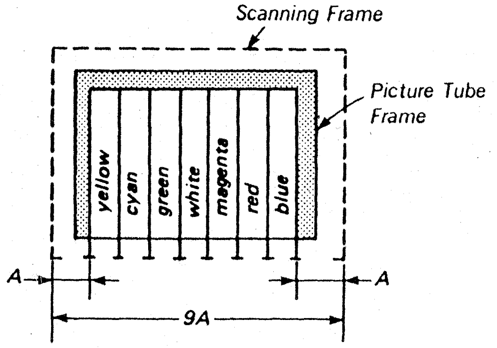

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

VIDEO/AUDIO, SERVO/SYSTEM CONTROL, MODE CONTROL, VIEWFINDER BLOCKS

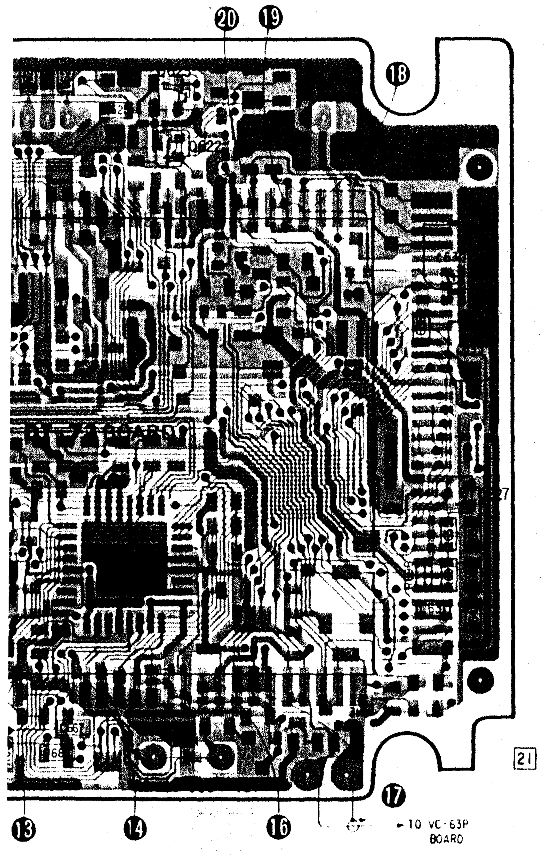
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

[REC Mode setting]

1) Input the video signal to TP362 on VA-43 board. (Connect GND with TP361.)
2) Make soldering bridge for TPA land of VA-43 board.
3) Set to the camera mode.
4) Set to REC mode.
5) Make shorting 6 times for SVP (service point) of FV-4P board. ("6" is displayed on LCD.)
6) Input signal is monitored.

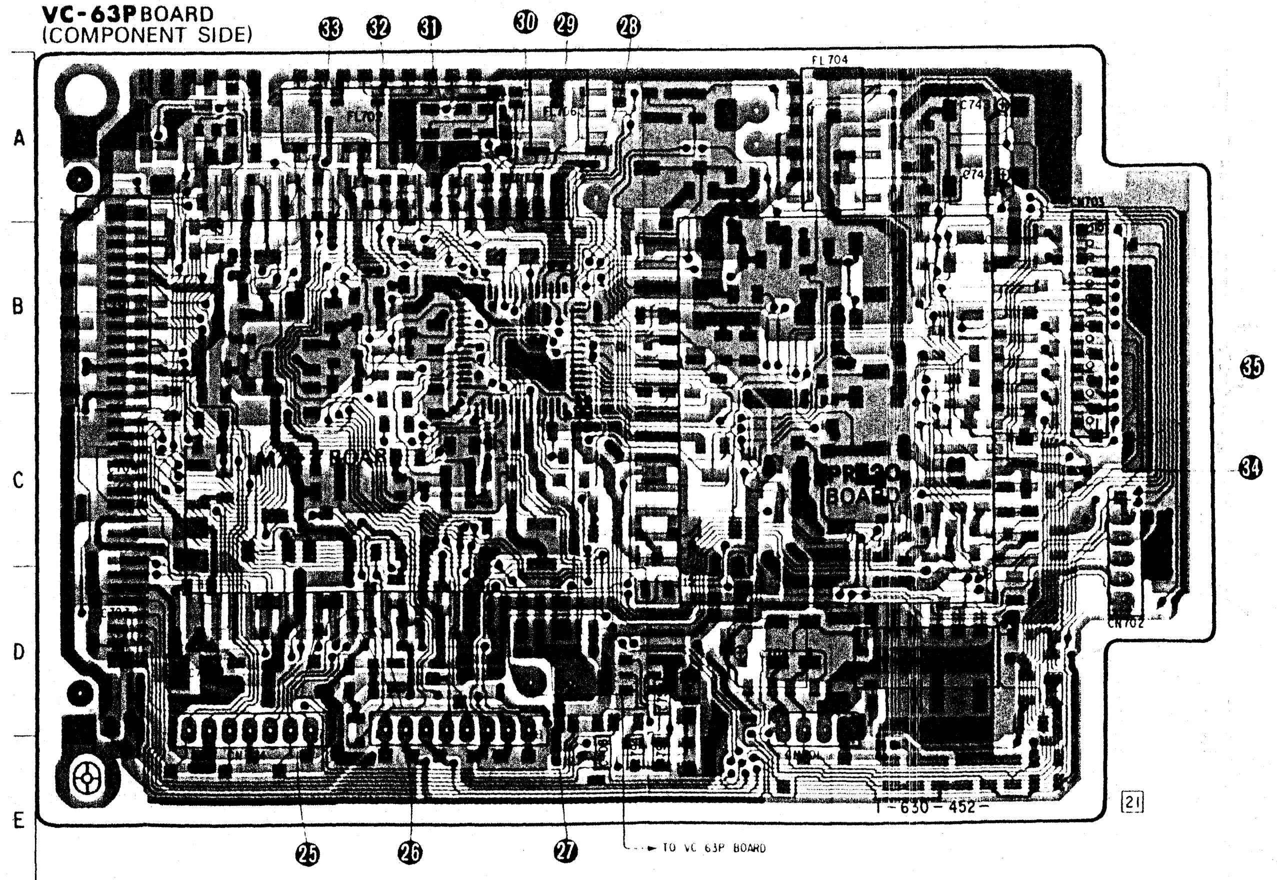
Note: When releasing, make shorting again for SVP of FV-4P board, or turn the power supply off.

C-21P (RELAY) PRINTED WIRING BOARDS


⑳
⑲
⑱
⑬
⑭
⑯
⑰
TO VC-63P BOARD
21

IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

VC-63P BOARD
(COMPONENT SIDE)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㉜
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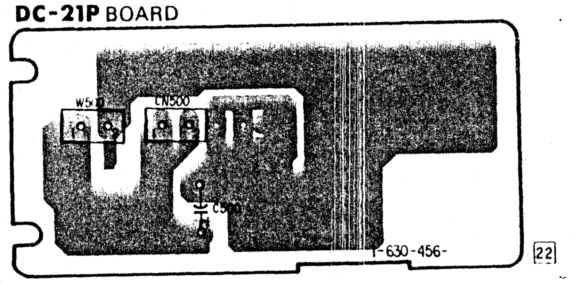
㉚
㉙
㉘
A
B
C
D
E
FL704
㉟
㉞
㉕
㉖
㉗
1-630-452-
21
TO VC-63P BOARD

DC-21P BOARD


W500
CN500
1-630-456-
22

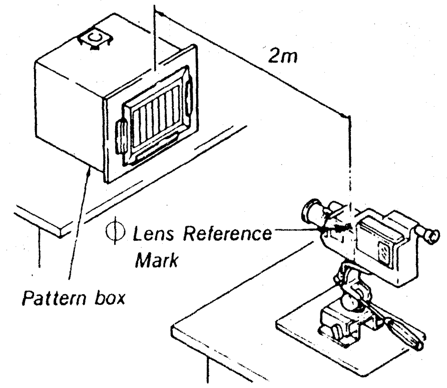
or dotted

- **For voltage and waveforms.**

[CAMERA (1), CAMERA (2), AUTO FOCUS, CAMERA (3) BLOCKS]

- Voltage and waveform measuring conditions:
  - (1) Sample object : Pattern box color bars.
  - (2) Voltage values : Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Φ Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.

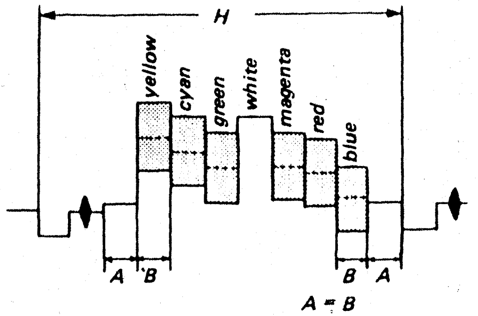

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A ≒ B

Fig. a Camera output waveform of J361 on VA-43 board

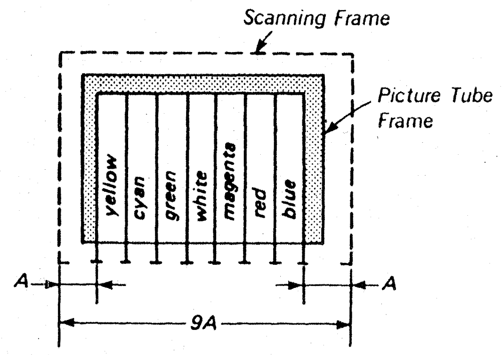

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

[VIDEO/AUDIO, SERVO/SYSTEM CONTROL, MODE CONTROL, VIEWFINDER BLOCKS]

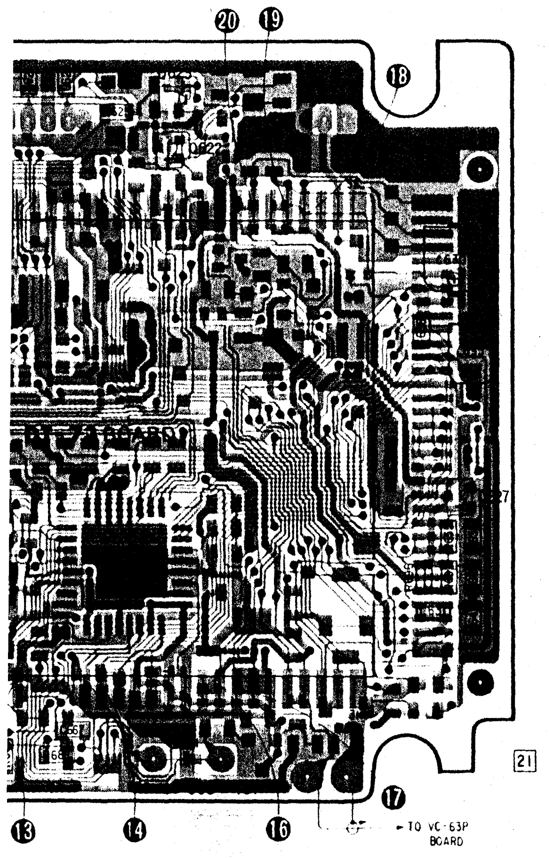
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production to lerances.

[REC Mode setting]

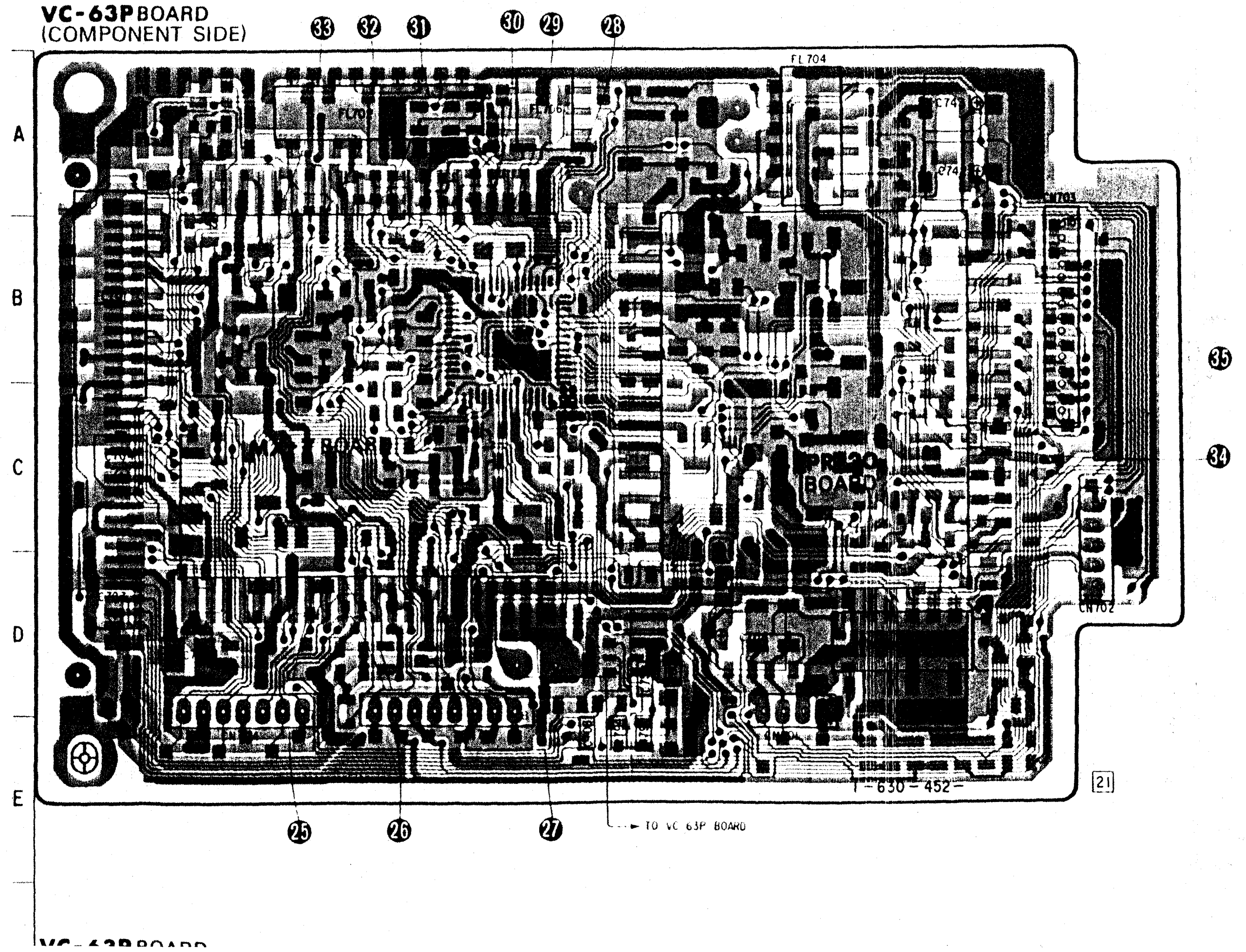
1) Input the video signal to TP362 on VA-43 board. (Connect GND with TP361.)
2) Make soldering bridge for TPA land of VA-43 board.
3) Set to the camera mode.
4) Set to REC mode.
5) Make shorting 6 times for SVP (service point) of FV-4P board. ("6" is displayed on LCD.)
6) Input signal is monitored.

Note: When releasing, make shorting again for SVP of FV-4P board, or turn the power supply off.

C-21P (RELAY) PRINTED WIRING BOARDS

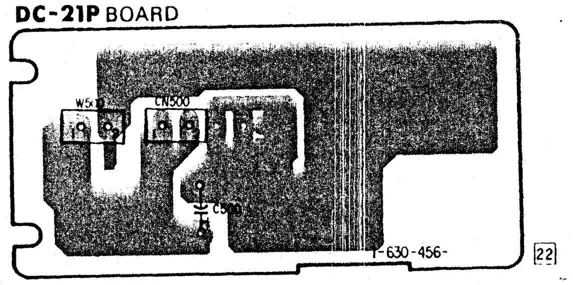

⑳
⑲
⑱
⑬
⑭
⑯
⑰
21
TO VC-63P BOARD

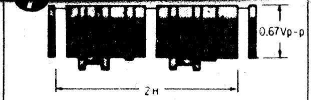
VC-63P BOARD
(COMPONENT SIDE)


㉝
㉜
㉛
㉚
㉙
㉘
FL704
㉟
㉞
A
B
C
D
E
CN702
1-630-452-
21
㉕
㉖
㉗
TO VC-63P BOARD
VC-63P BOARD

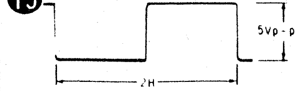
IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

DC-21P BOARD

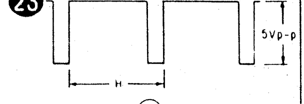

W500
CN500
1-630-456-
22



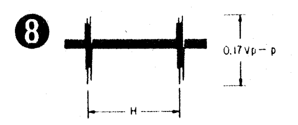
Q600 Ⓢ



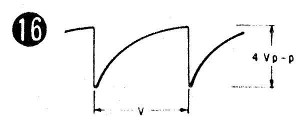
DT-73 BOARD ⑦



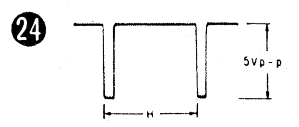
IC621 ㉜



IC600 ④

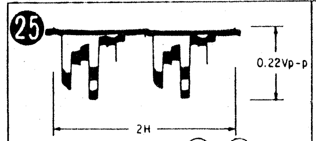


DT-73 BOARD ㉓

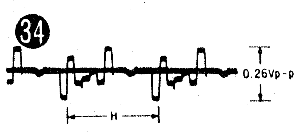


IC621 ㉛

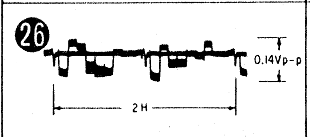
VC-63P BOARD



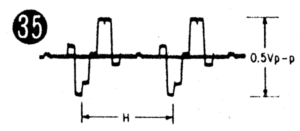
MX-7 BOARD ⑦, ⑧



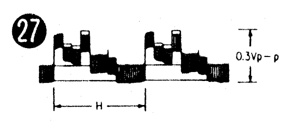
PR-20 BOARD ㉑



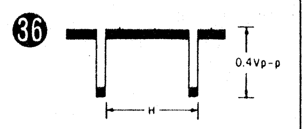
MX-7 BOARD ⑨, ⑪



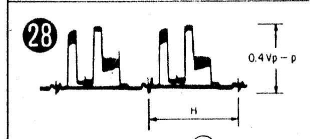
PR-20 BOARD ㉒



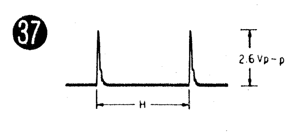
MX-7 BOARD ㉒



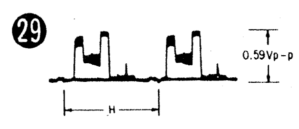
IC701 ⑮



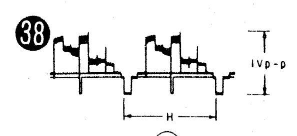
MX-7 BOARD ㉓



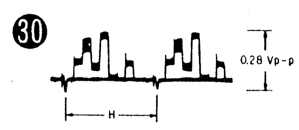
IC701 ⑯



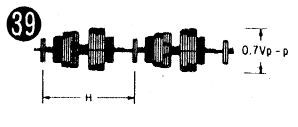
MX-7 BOARD ㉕



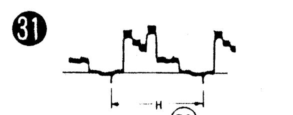
IC701 ㉒



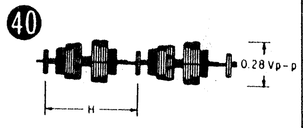
MX-7 BOARD ㉖



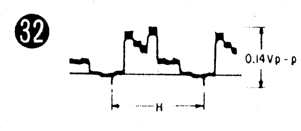
IC701 ㉔



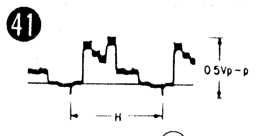
MX-7 BOARD ㉚ 1Vp-p
㉝ 0.26Vp-p



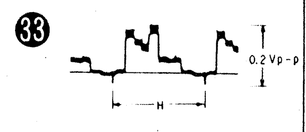
IC701 ㉖



MX-7 BOARD ㊱



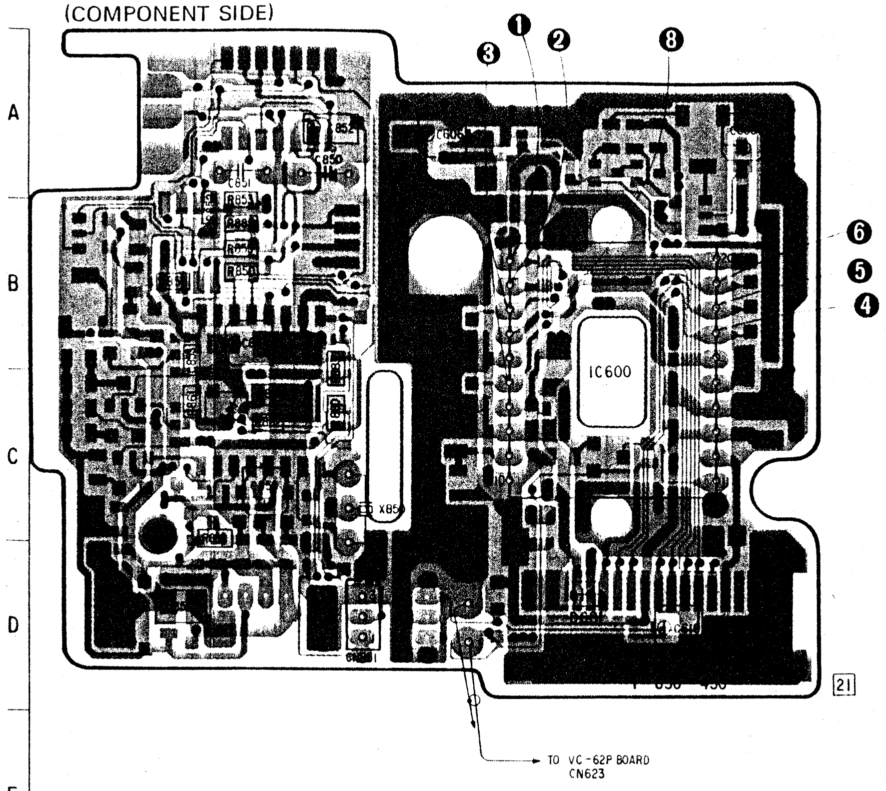
IC701 ㊵



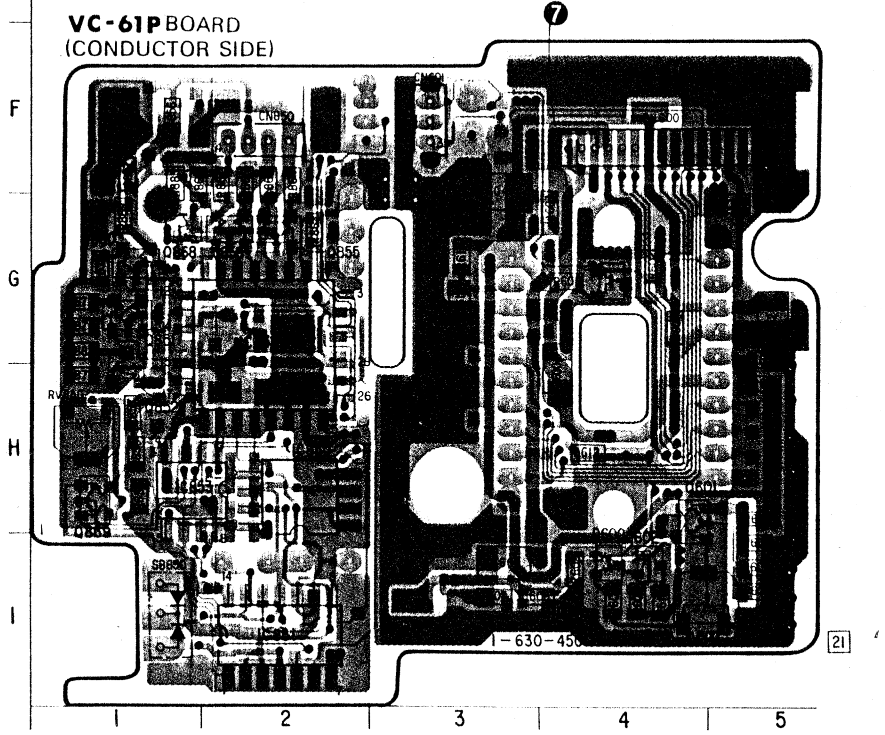
MX-7 BOARD ㊴

D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1

VC-61P BOARD
(COMPONENT SIDE)


A
B
C
D
E
❶
❷
❸
❹
❺
❻
❽
IC600
TO VC-62P BOARD CN623
21

VC-61P BOARD
(CONDUCTOR SIDE)


F
G
H
I
❼
1-630-450
21
1
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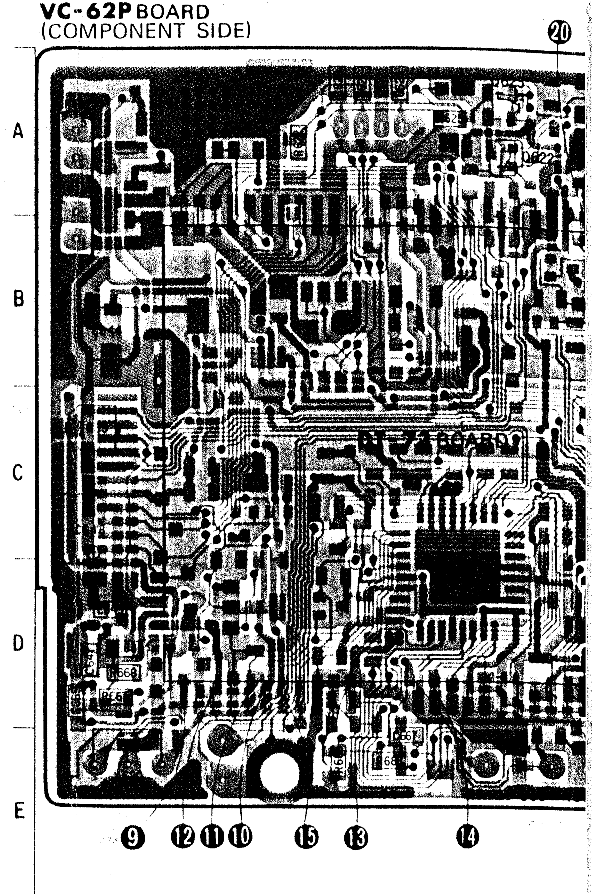
5

D623	G-1
D624	G-2
D625	F-3
D626	I-3
IC620	I-2
IC621	H-3
Q620	J-4
Q621	J-4
Q622	A-3
Q623	A-3
Q624	H-4
Q625	I-4
Q626	I-4
Q627	C-5
Q628	I-4
Q629	G-1
Q630	G-2
Q631	H-2
Q632	H-2
Q633	G-2
Q634	F-4

VC-62P BOARD
(COMPONENT SIDE)


⓴
A
B
C
D
E
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⓫
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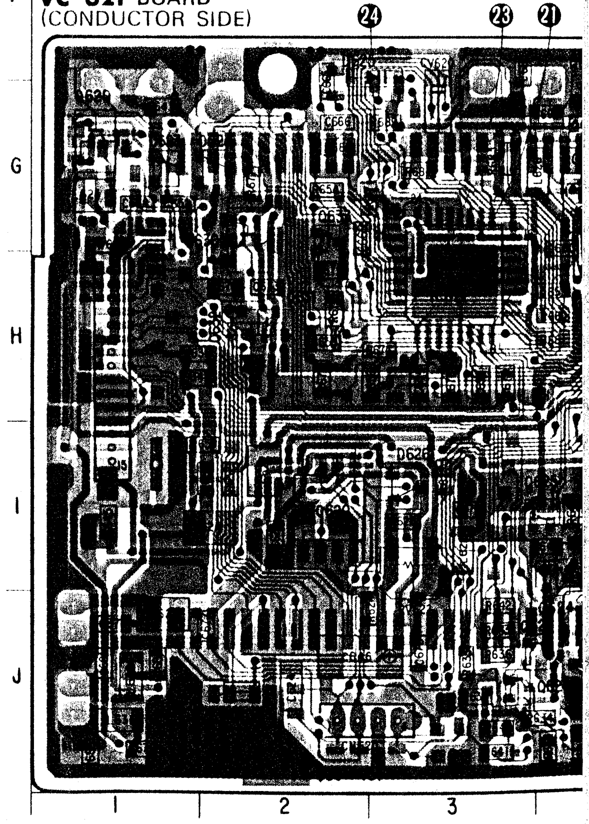
⓮

F

VC-62P BOARD
(CONDUCTOR SIDE)


㉔
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G
H
I
J
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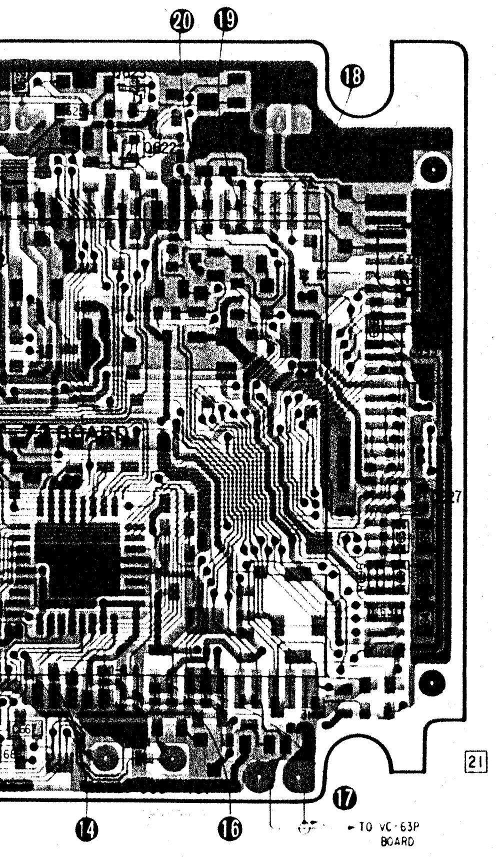
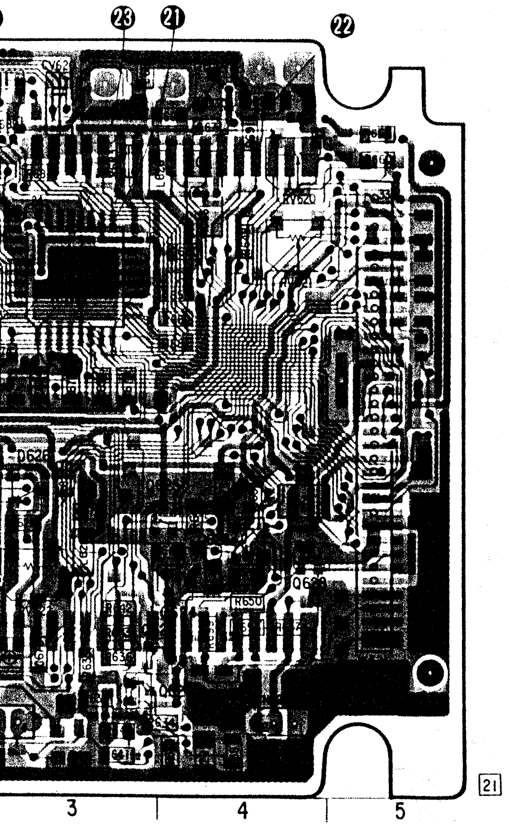
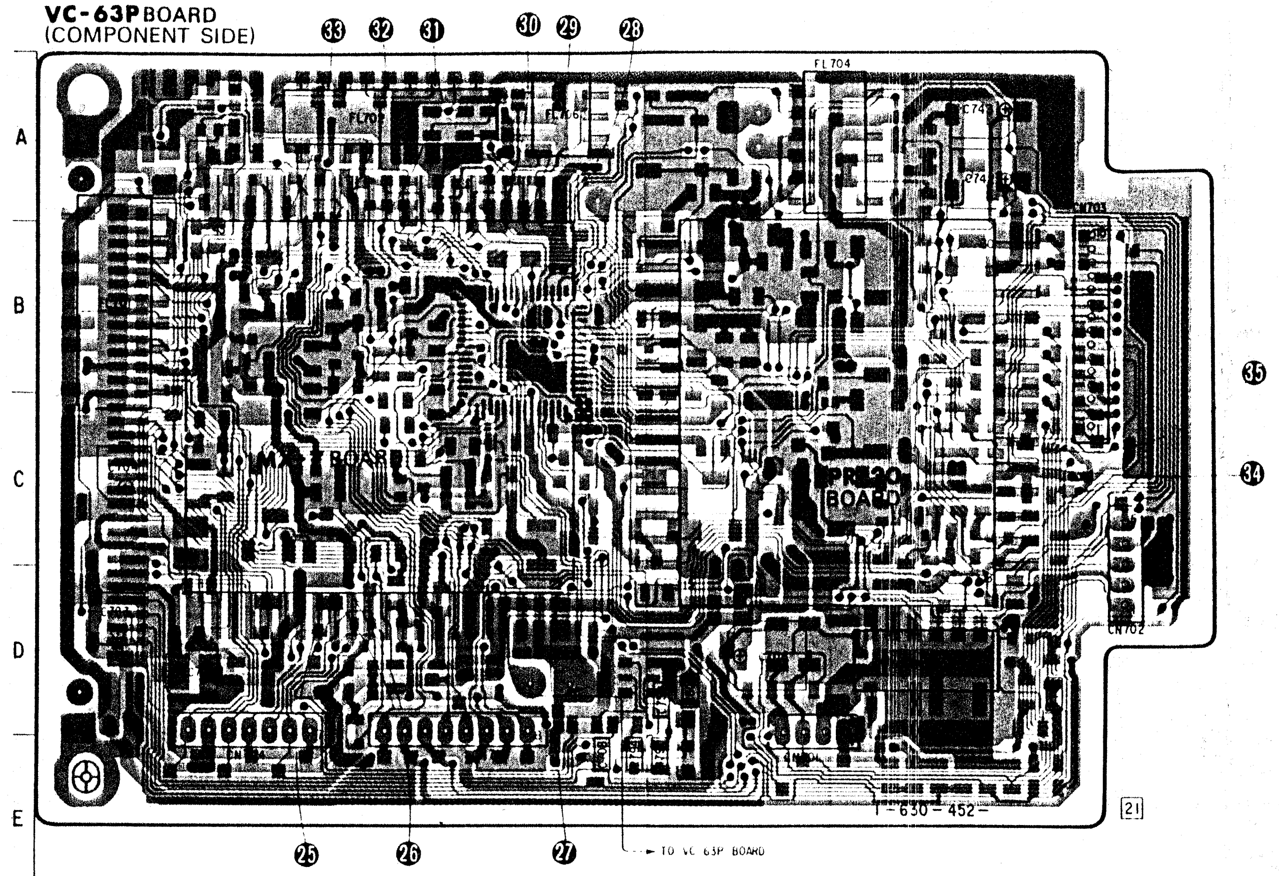

⑳
⑲
⑱
⑭
⑯
⑰
TO VC-63P BOARD
21



IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

VC-63P BOARD
(COMPONENT SIDE)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A
B
C
D
E
FL704
CN702
MA-1 BOARD
PRE-20 BOARD
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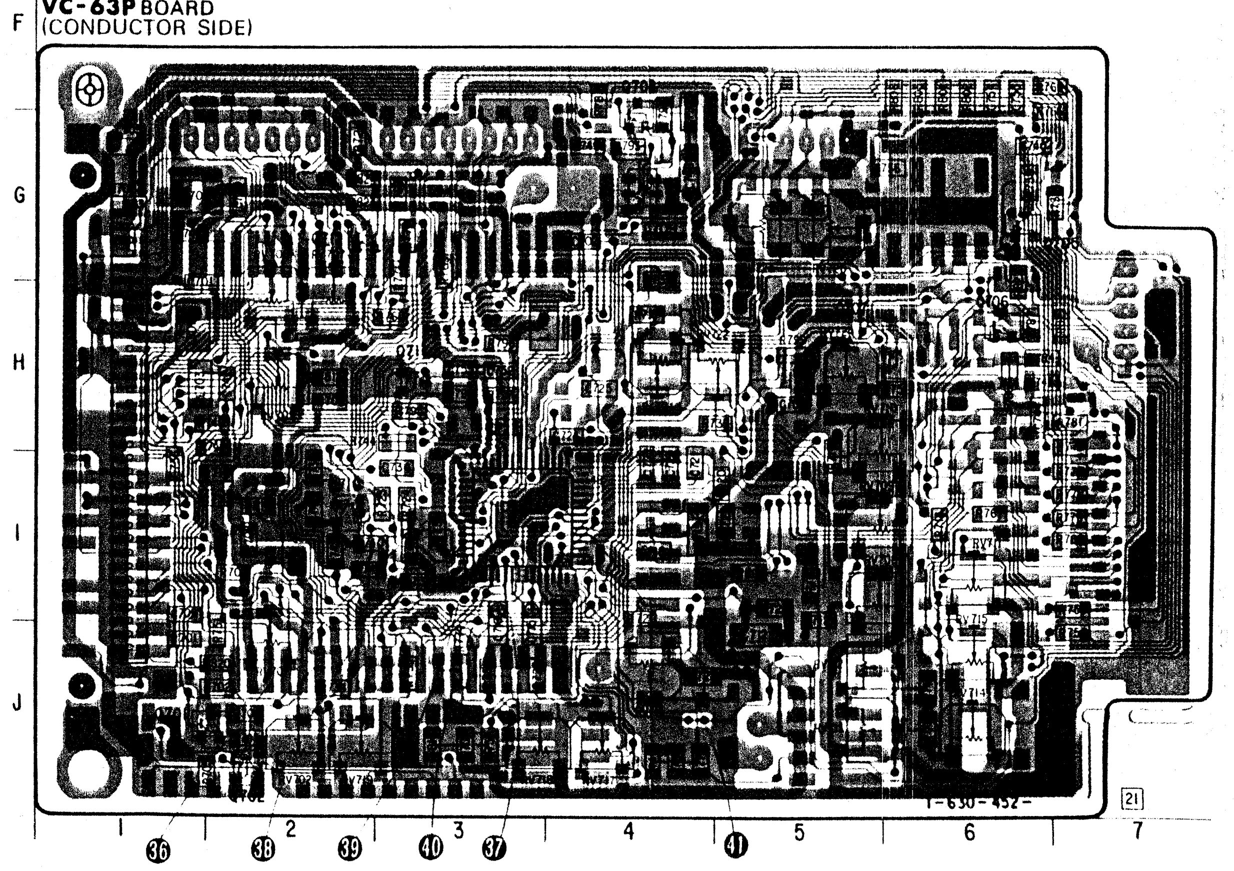
㉞
1-630-452-
21
㉕
㉖
㉗
TO VC-63P BOARD

VC-63P BOARD
(CONDUCTOR SIDE)


F
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1-630-452-
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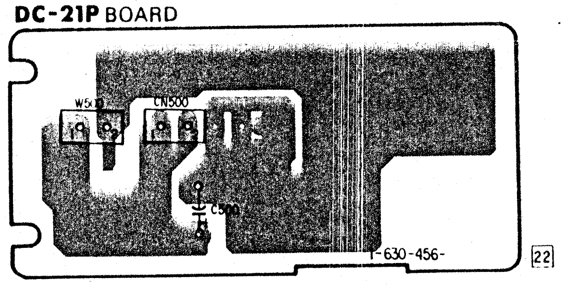
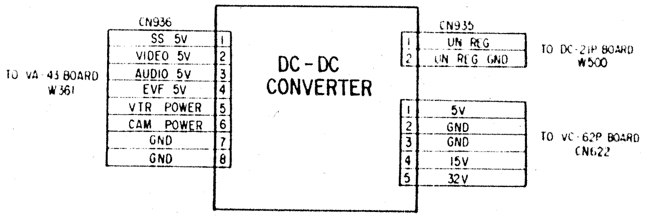
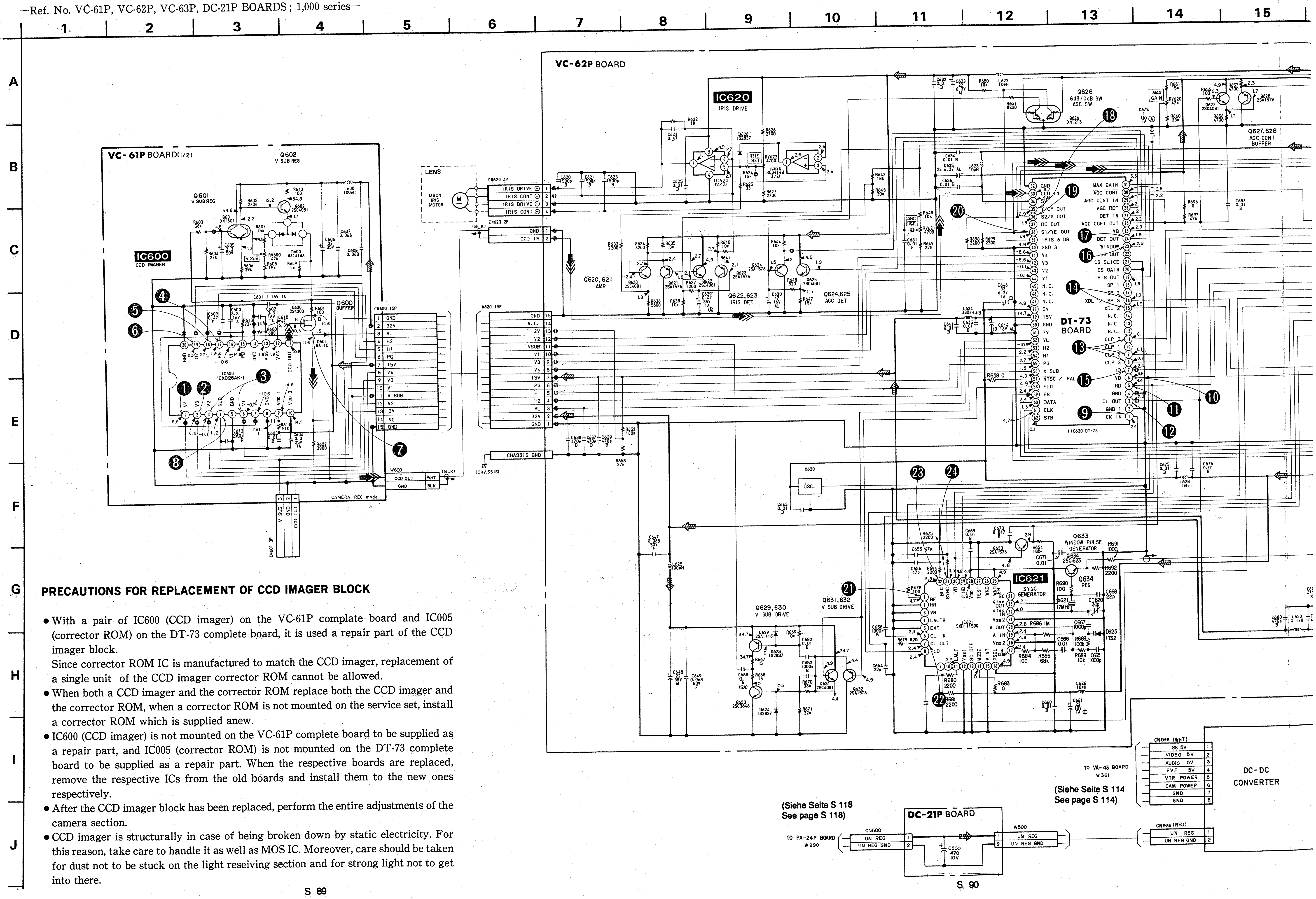
DC-21P BOARD


W500
CN500
C500
1-630-456-
22


DC-DC CONVERTER
CN936
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
1
2
3
4
5
6
7
8
TO VA-43 BOARD W361
CN935
1 UN REG
2 UN REG GND
TO DC-21P BOARD W500
1 5V
2 GND
3 GND
4 15V
5 32V
TO VC-62P BOARD CN622

VC-61P (CCD IMAGER), VC-62P (TIMING/SYNC GENERATOR), VC-63P (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21P (RELAY) SCHEMATIC DIAGRAM

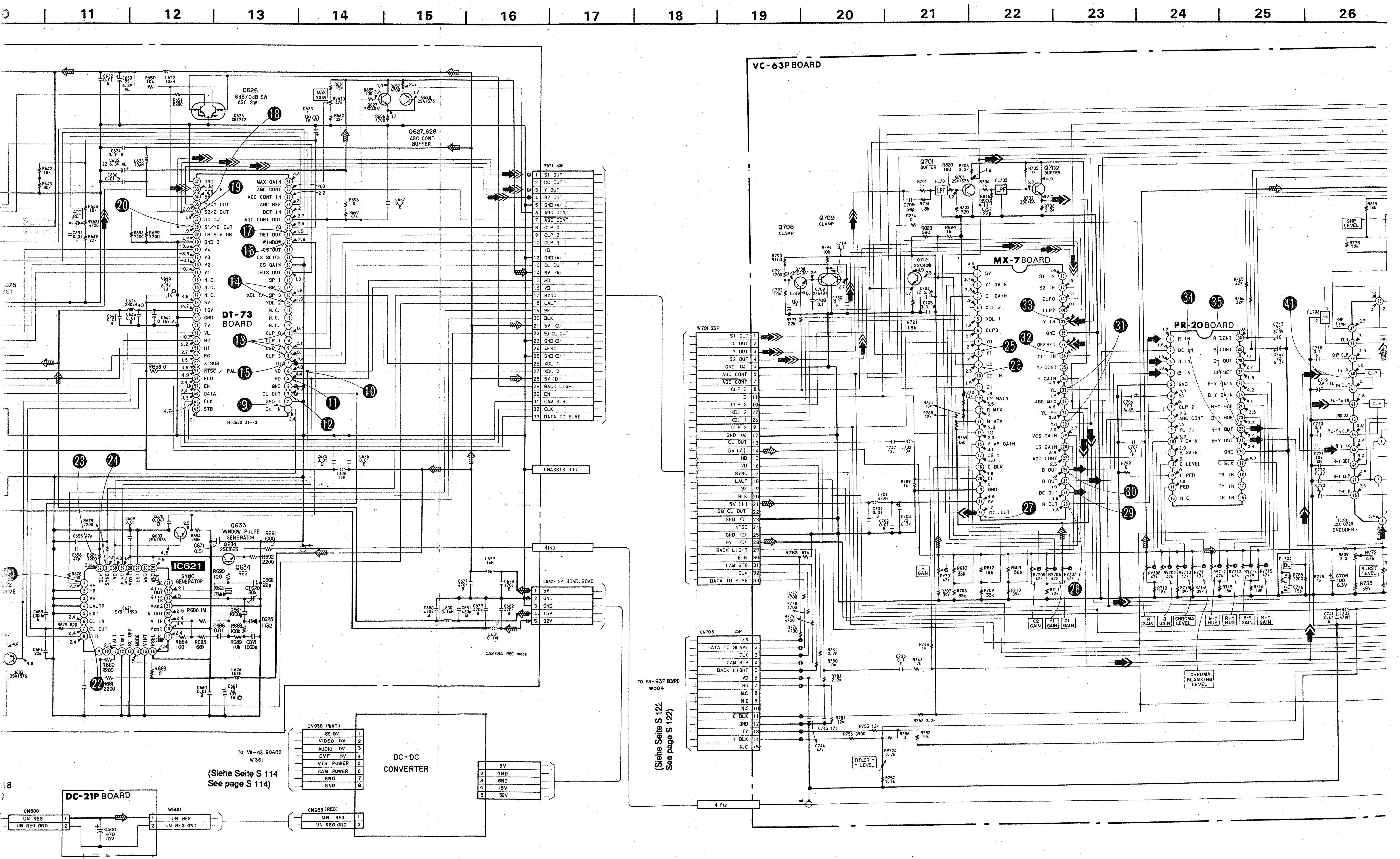
—Ref. No. VC-61P, VC-62P, VC-63P, DC-21P BOARDS ; 1,000 series—



VC-61P BOARD(1/2)
IC600 CCD IMAGER
IC600 ICX026AK-1
Q601 V SUB REG
Q602 V SUB REG
Q600 BUFFER
CN600 15P
LENS
M904 IRIS MOTOR
VC-62P BOARD
IC620 IRIS DRIVE
Q620,621 AMP
Q622,623 IRIS DET
Q624,625 AGC DET
Q626 6dB/0dB SW AGC SW
Q627,628 AGC CONT BUFFER
DT-73 BOARD
HIC620 DT-73
X620 OSC.
IC621 SYNC GENERATOR
Q629,630 V SUB DRIVE
Q631,632 V SUB DRIVE
Q633 WINDOW PULSE GENERATOR
Q634 REG
CHASSIS GND
CAMERA REC mode
W600
CN601 3P
DC-21P BOARD
CN500
W500
TO PA-24P BOARD W990
TO VA-43 BOARD W361
CN936 (WHT)
CN935 (RED)
DC-DC CONVERTER
(Siehe Seite S 118 See page S 118)
(Siehe Seite S 114 See page S 114)

PRECAUTIONS FOR REPLACEMENT OF CCD IMAGER BLOCK

- With a pair of IC600 (CCD imager) on the VC-61P complate board and IC005 (corrector ROM) on the DT-73 complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC600 (CCD imager) is not mounted on the VC-61P complete board to be supplied as a repair part, and IC005 (corrector ROM) is not mounted on the DT-73 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new ones respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity. For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.


11
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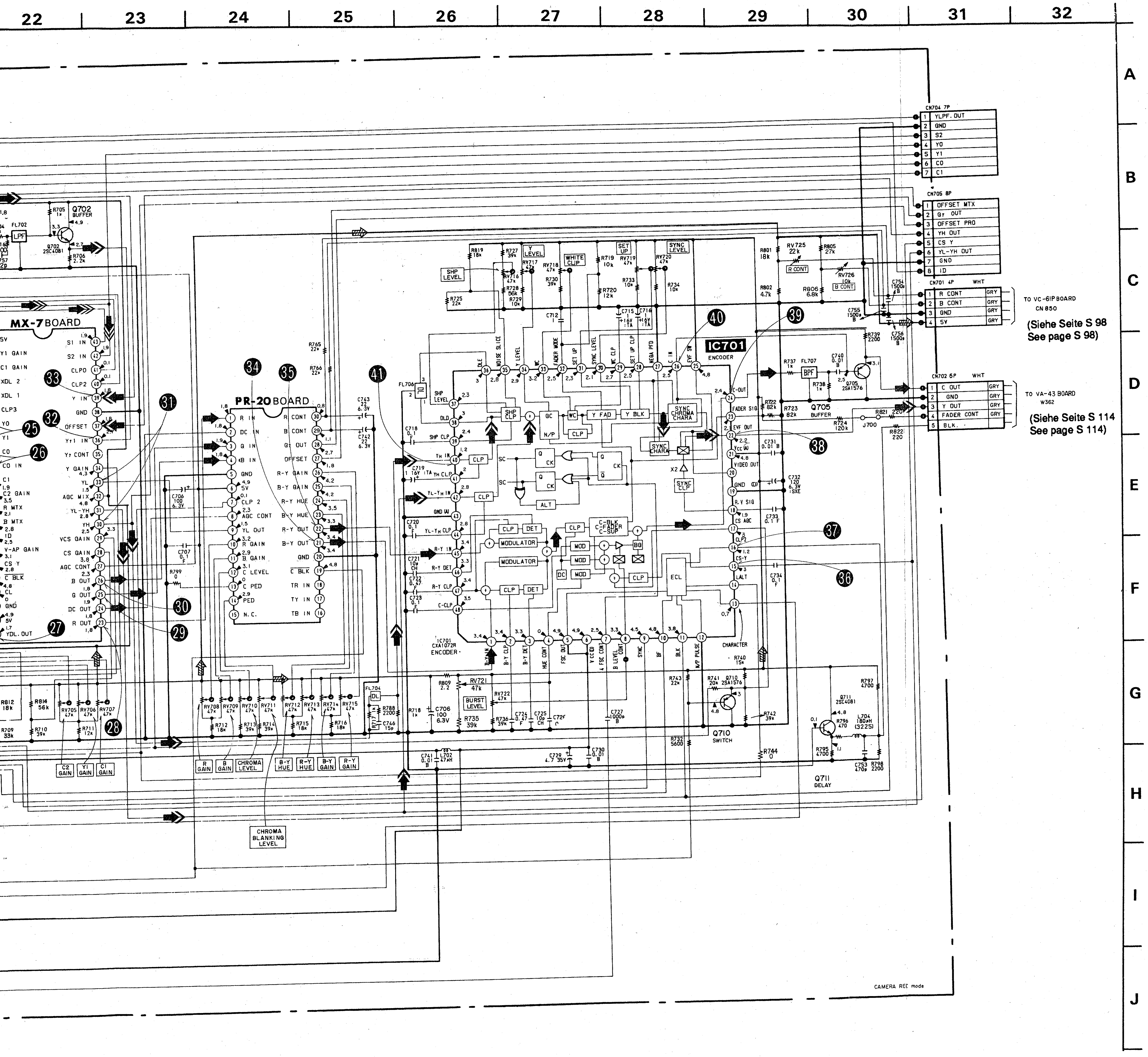
Q626 6dB/0dB SW AGC SW
Q627,628 AGC CONT BUFFER
MAX GAIN
DT-73 BOARD
HIC620 DT-73
W621 33P
S1 OUT
DC OUT
Y OUT
S2 OUT
GND (A)
AGC CONT
CLP 0
CLP 2
CLP 3
ID
CL OUT
5V (A)
HD
VD
SYNC
LALT
BF
BLK
5V (D)
SG CL OUT
GND (D)
4FSC
XDL 1
XDL 2
BACK LIGHT
EN
CAM STB
CLK
DATA TO SLVE
CHASSIS GND
4fsc
CN622 SP BOAD. BOAD
5V
GND
15V
32V
CAMERA REC mode
Q633 WINDOW PULSE GENERATOR
Q634 REG
IC621 SYNC GENERATOR
IC621 CXD-1159Q
CN936 (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
DC-DC CONVERTER
CN935 (RED)
UN REG
UN REG GND
TO VA-43 BOARD W361
(Siehe Seite S 114
See page S 114)
DC-21P BOARD
CN500
W500
C500 470 10V
VC-63P BOARD
Q701 BUFFER
Q702 BUFFER
Q708 CLAMP
Q709 CLAMP
LPF
MX-7 BOARD
PR-20 BOARD
IC701 CXA1072R ENCODER
W701 33P
CN703 15P
TO SS-93P BOARD W004
(Siehe Seite S 122
See page S 122)
DATA TO SLAVE
C BLK
TY
Y BLK
TITLER Y Y LEVEL
Y GAIN
C2 GAIN
Y1 GAIN
C1 GAIN
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
CHROMA BLANKING LEVEL
SHP LEVEL
BURST LEVEL
CLP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D
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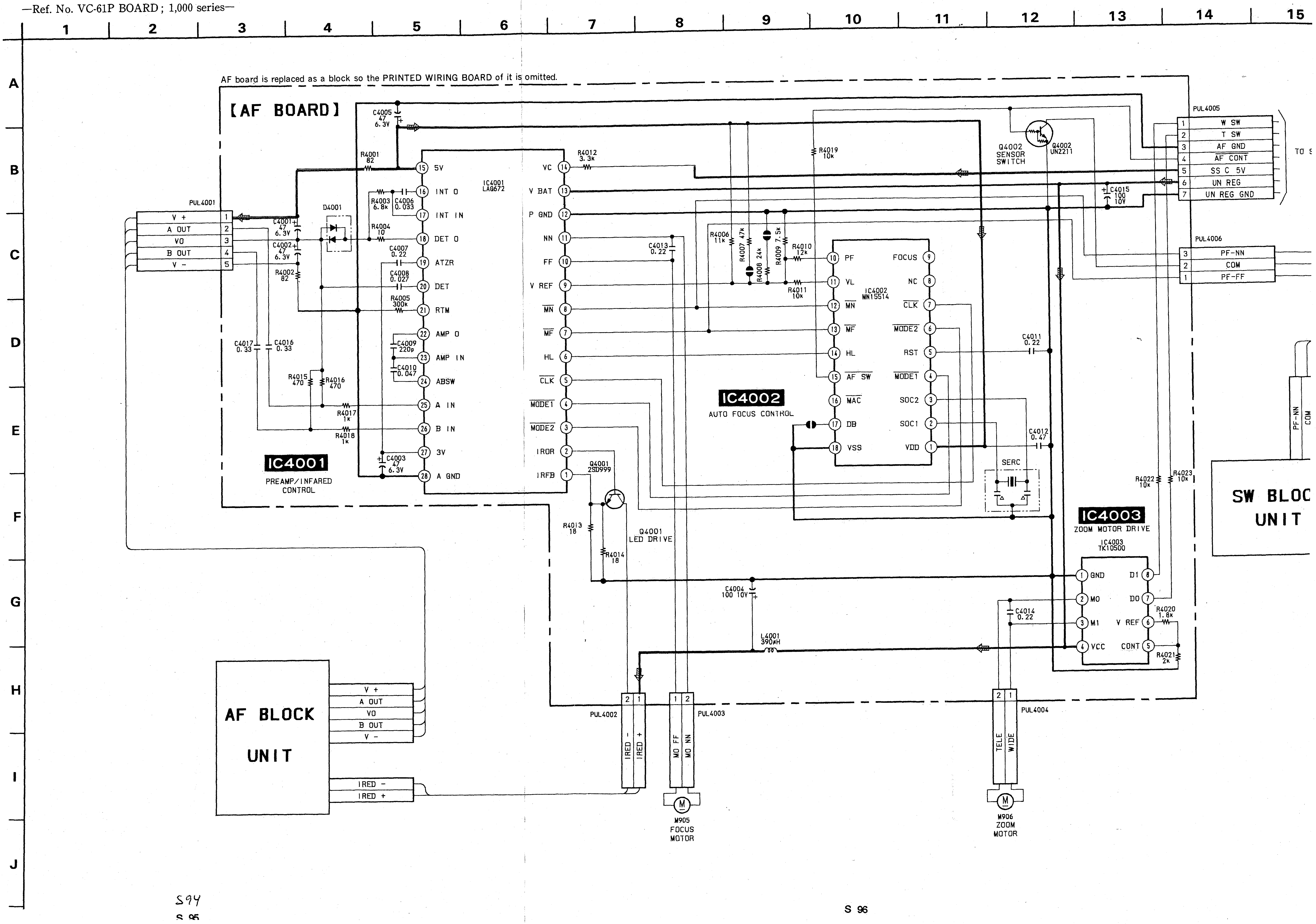
F
G
H
I
J
MX-7 BOARD
PR-20 BOARD
IC701
ENCODER
IC701 CXA1072R ENCODER
Q702 BUFFER
Q705 BUFFER
Q710 SWITCH
Q711 DELAY
CN704 7P
YLPF. OUT
GND
S2
Y0
Y1
C0
C1
CN705 8P
OFFSET MTX
G γ OUT
OFFSET PRO
YH OUT
CS Y
YL-YH OUT
GND
ID
CN701 4P WHT
R CONT
B CONT
GND
5V
TO VC-61P BOARD CN850
(Siehe Seite S 98
See page S 98)
CN702 6P WHT
C OUT
GND
Y OUT
FADER CONT
BLK.
TO VA-43 BOARD W362
(Siehe Seite S 114
See page S 114)
SHP LEVEL
Y LEVEL
WHITE CLIP
SET UP
SYNC LEVEL
R CONT
B CONT
BURST LEVEL
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
C2 GAIN
Y1 GAIN
C1 GAIN
CHROMA BLANKING LEVEL
CHARACTER
CAMERA REC mode

- **Signal path**
  - ⇛ : REC Y Signal
  - ⇛ : REC Y/CHROMA Signal
  - ➡ : REC AUDIO Signal

VC-61P (AUTO WHITE BALANCE), AF BOARD (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. VC-61P BOARD ; 1,000 series—



AF board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

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A
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D
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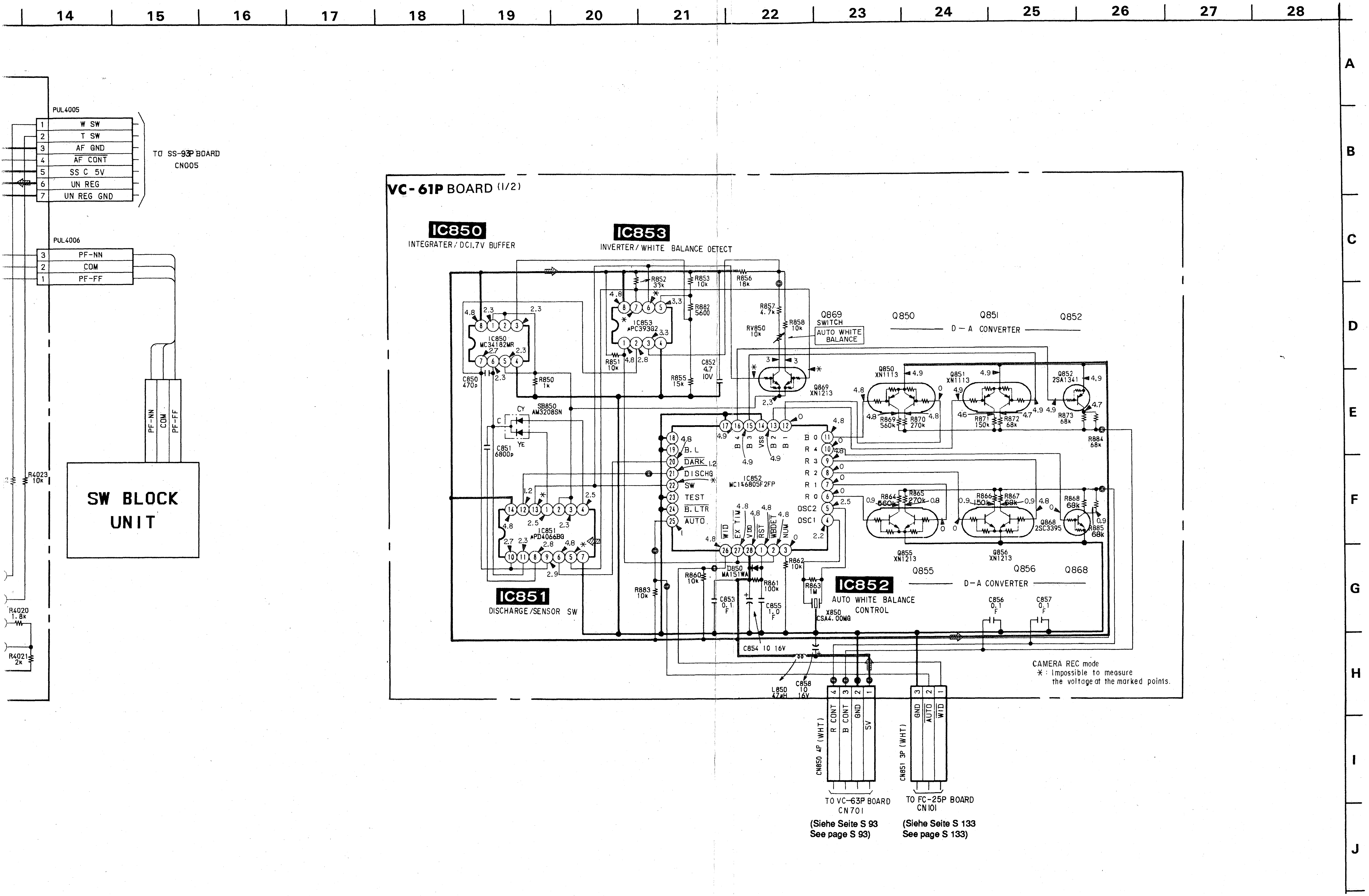
G
H
I
J
【AF BOARD】
PUL4001
V +
A OUT
VO
B OUT
V −
C4005 47 6.3V
R4001 82
C4001 47 6.3V
C4002 47 6.3V
R4002 82
D4001
R4003 6.8k
C4006 0.033
R4004 10
C4007 0.22
C4008 0.027
R4005 300k
C4009 220p
C4010 0.047
C4017 0.33
C4016 0.33
R4015 470
R4016 470
R4017 1k
R4018 1k
C4003 47 6.3V
IC4001
PREAMP/INFARED CONTROL
IC4001 LAG672
5V
INT O
INT IN
DET O
ATZR
DET
RTM
AMP O
AMP IN
ABSW
A IN
B IN
3V
A GND
VC
V BAT
P GND
NN
FF
V REF
MN
MF
HL
CLK
MODE1
MODE2
IROR
IRFB
R4012 3.3k
Q4001 2SD999
Q4001 LED DRIVE
R4013 18
R4014 18
C4013 0.22
R4006 11k
R4007 47k
R4008 24k
R4009 7.5k
R4010 12k
R4011 10k
R4019 10k
IC4002
AUTO FOCUS CONTROL
IC4002 MN15514
PF
VL
MN
MF
HL
AF SW
MAC
DB
VSS
FOCUS
NC
CLK
MODE2
RST
MODE1
SOC2
SOC1
VDD
Q4002 SENSOR SWITCH
Q4002 UN2211
C4011 0.22
C4012 0.47
SERC
C4015 100 10V
PUL4005
W SW
T SW
AF GND
AF CONT
SS C 5V
UN REG
UN REG GND
TO S
PUL4006
PF-NN
COM
PF-FF
SW BLOC
UNIT
IC4003
ZOOM MOTOR DRIVE
IC4003 TK10500
GND
MO
M1
VCC
D1
DO
V REF
CONT
R4020 1.8k
R4021 2k
R4022 10k
R4023 10k
C4014 0.22
C4004 100 10V
L4001 390μH
AF BLOCK
UNIT
IRED −
IRED +
PUL4002
PUL4003
MO FF
MO NN
M905
FOCUS MOTOR
PUL4004
TELE
WIDE
M906
ZOOM MOTOR

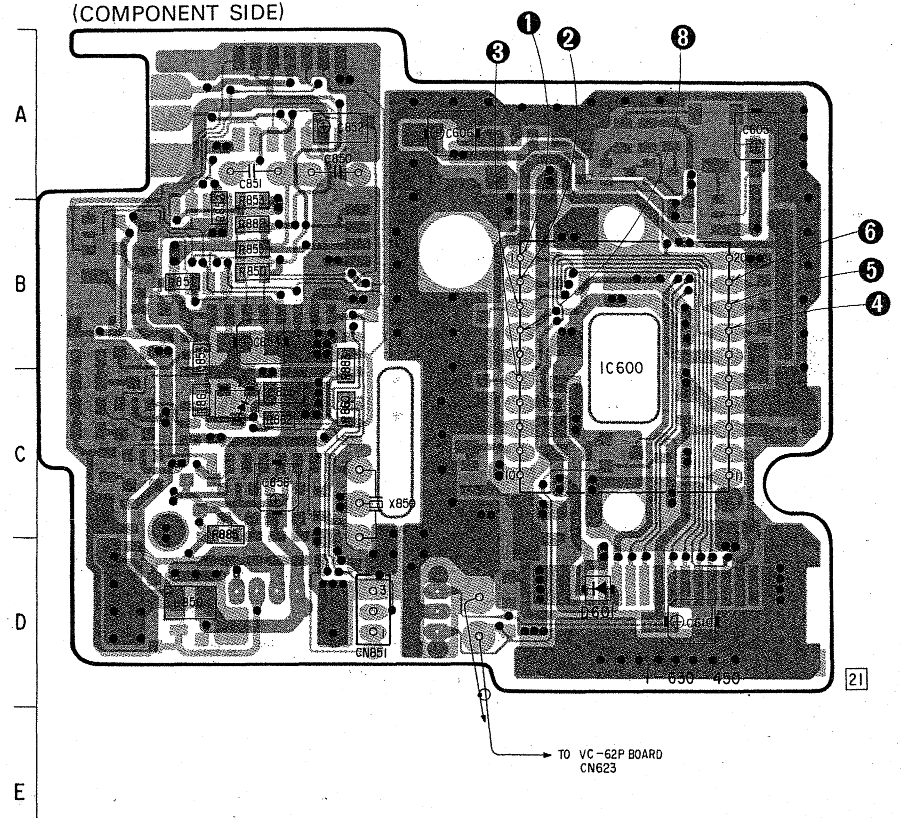
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
A
B
C
D
E
F
G
H
I
J
PUL4005
1 W SW
2 T SW
3 AF GND
4 AF CONT
5 SS C 5V
6 UN REG
7 UN REG GND
TO SS-93P BOARD
CN005
PUL4006
3 PF-NN
2 COM
1 PF-FF
PF-NN
COM
PF-FF
SW BLOCK UNIT
R4023 10k
R4020 1.8k
R4021 2k
VC-61P BOARD (1/2)
IC850
INTEGRATER/DC1.7V BUFFER
IC853
INVERTER/WHITE BALANCE DETECT
IC850 MC34182MR
IC853 μPC393G2
R852 33k
R853 10k
R856 18k
R882 5600
R857 4.7k
R858 10k
RV850 10k
R850 1k
R851 10k
C850 470p
C852 4.7 10V
R855 15k
SB850 AM3208SN
CY
C
YE
C851 6800p
Q869 SWITCH
AUTO WHITE BALANCE
Q869 XN1213
Q850
Q851
Q852
D-A CONVERTER
Q850 XN1113
Q851 XN1113
Q852 2SA1341
R869 560k
R870 270k
R871 150k
R872 68k
R873 68k
R884 68k
IC852 MC146805F2FP
B.L
DARK
DISCHG
SW
TEST
B.LTR
AUTO
B0 R4 R3 R2 R1 R0
OSC2
OSC1
WTD
EX TIM
VDD
RST
WBDET
NUM
VSS
IC851 μPD4066BG
IC851
DISCHARGE/SENSOR SW
R864 560k
R865 270k
R866 150k
R867 68k
R868 68k
R885 68k
Q868 2SC3395
Q855 XN1213
Q856 XN1213
Q855
Q856
Q868
D-A CONVERTER
IC852
AUTO WHITE BALANCE CONTROL
R860 10k
D850 MA151WA
R861 100k
R862 10k
R863 1M
R883 10k
C853 0.1 F
C855 1.0 F
X850 CSA4.00MG
C856 0.1 F
C857 0.1 F
C854 10 16V
L850 47μH
C858 10 16V
CAMERA REC mode
✱ : Impossible to measure the voltage at the marked points.
CN850 4P (WHT)
4 R CONT
3 B CONT
2 GND
1 5V
CN851 3P (WHT)
3 GND
2 AUTO
1 WTD
TO VC-63P BOARD CN701
(Siehe Seite S 93
See page S 93)
TO FC-25P BOARD CN101
(Siehe Seite S 133
See page S 133)

VC-61P (AUTO WHITE BALANCE), AF BOARD (AUTO FOCUS) PRINTED WIRING BOARDS

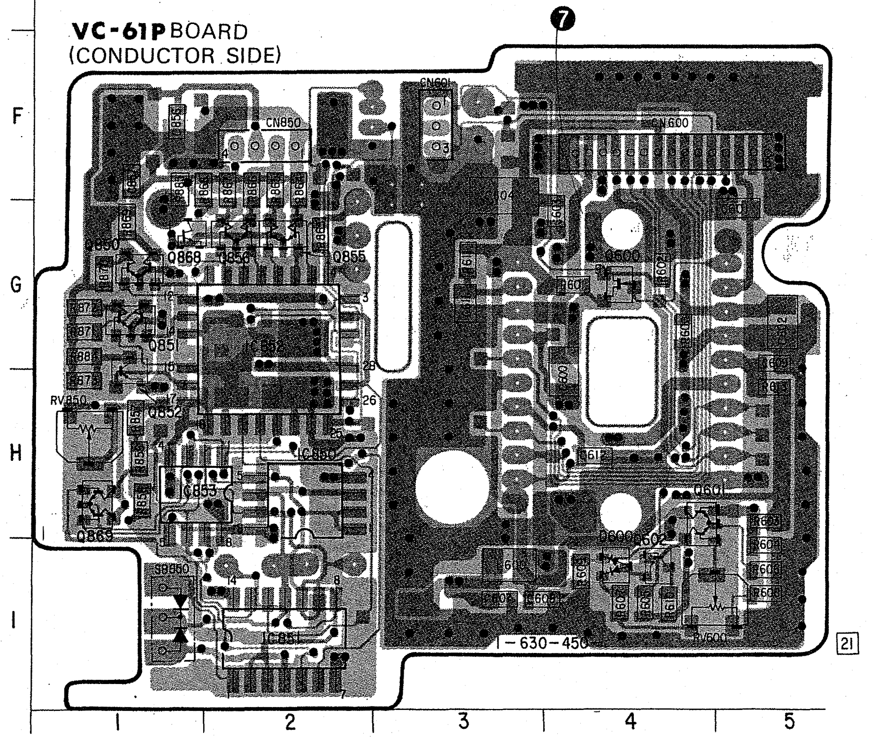
—Ref. No. VC-61P BOARD ; 1,000 series—

D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1

VC-61P BOARD
(COMPONENT SIDE)


A
B
C
D
E
❶
❷
❸
❽
❻
❺
❹
IC600
X850
CN851
D601
1-630-450
21
TO VC-62P BOARD CN623

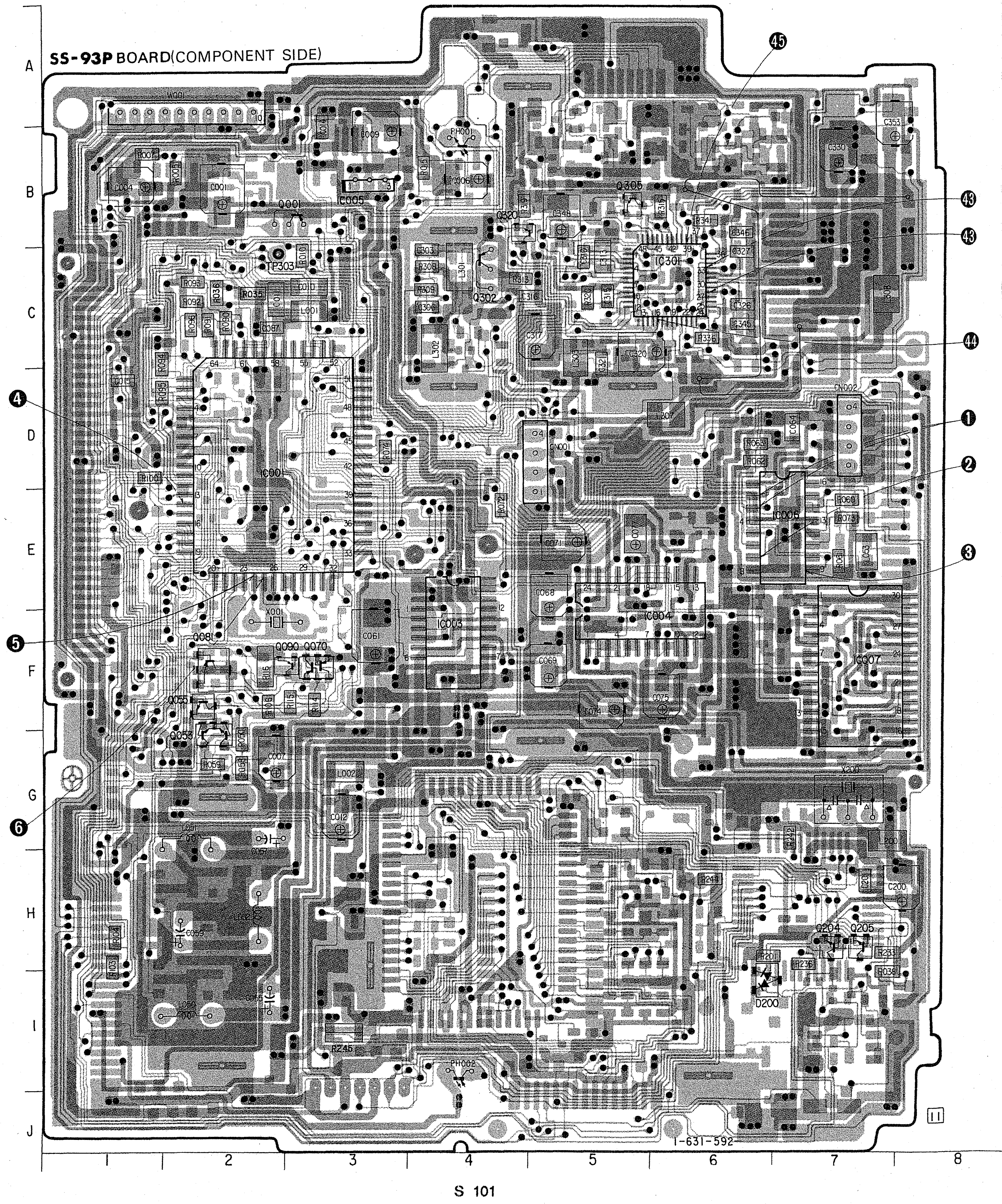
VC-61P BOARD
(CONDUCTOR SIDE)

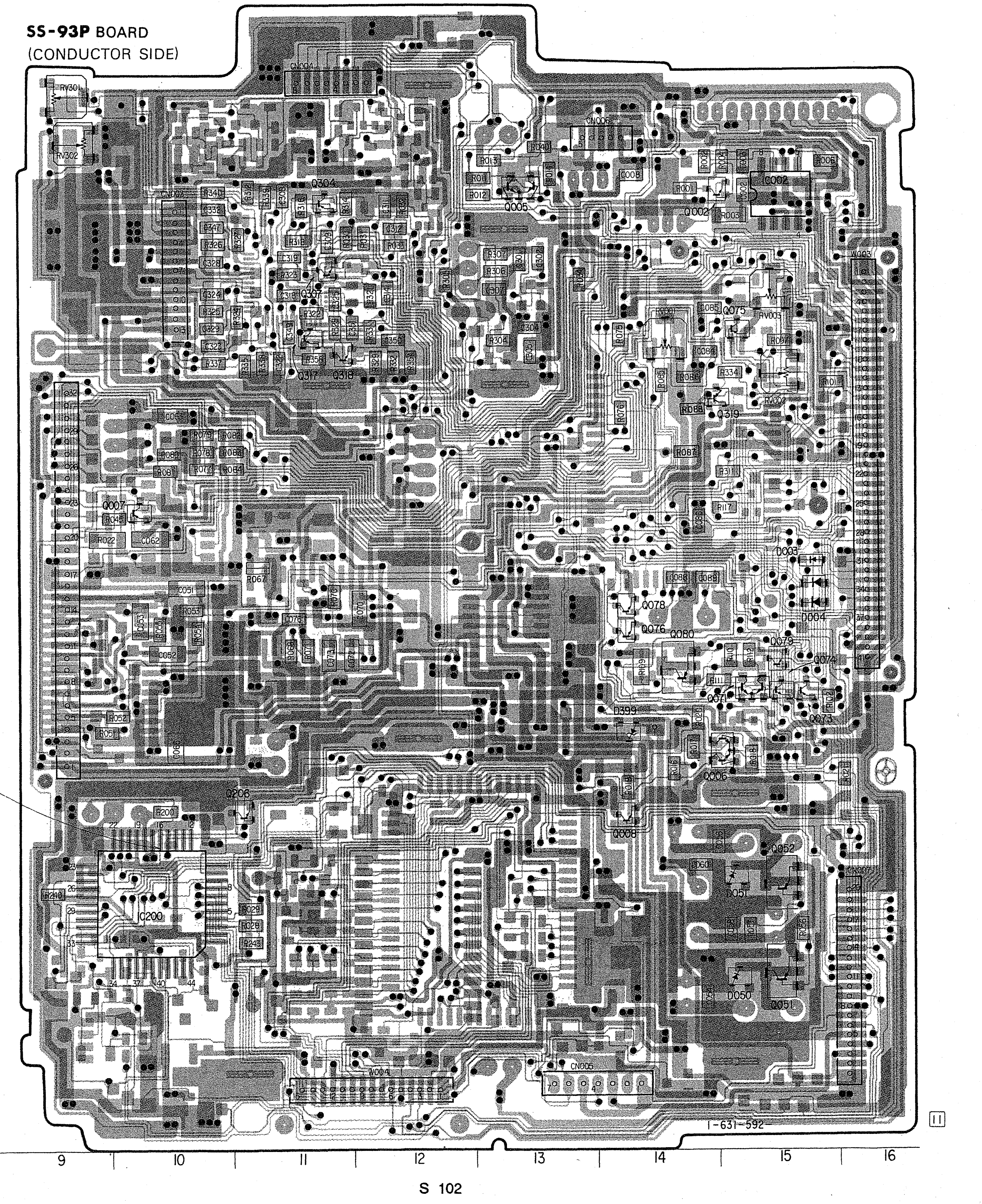

❼
F
G
H
I
1
2
3
4
5
CN601
CN850
CN600
Q868
Q855
Q851
Q869
RV850
IC850
IC851
Q600
Q602
Q601
1-630-450
21

SS-93P (ZOOM CONTROL) PRINTED WIRING BOARD

—Ref. No. SS-93P BOARD ; 2,000 series—

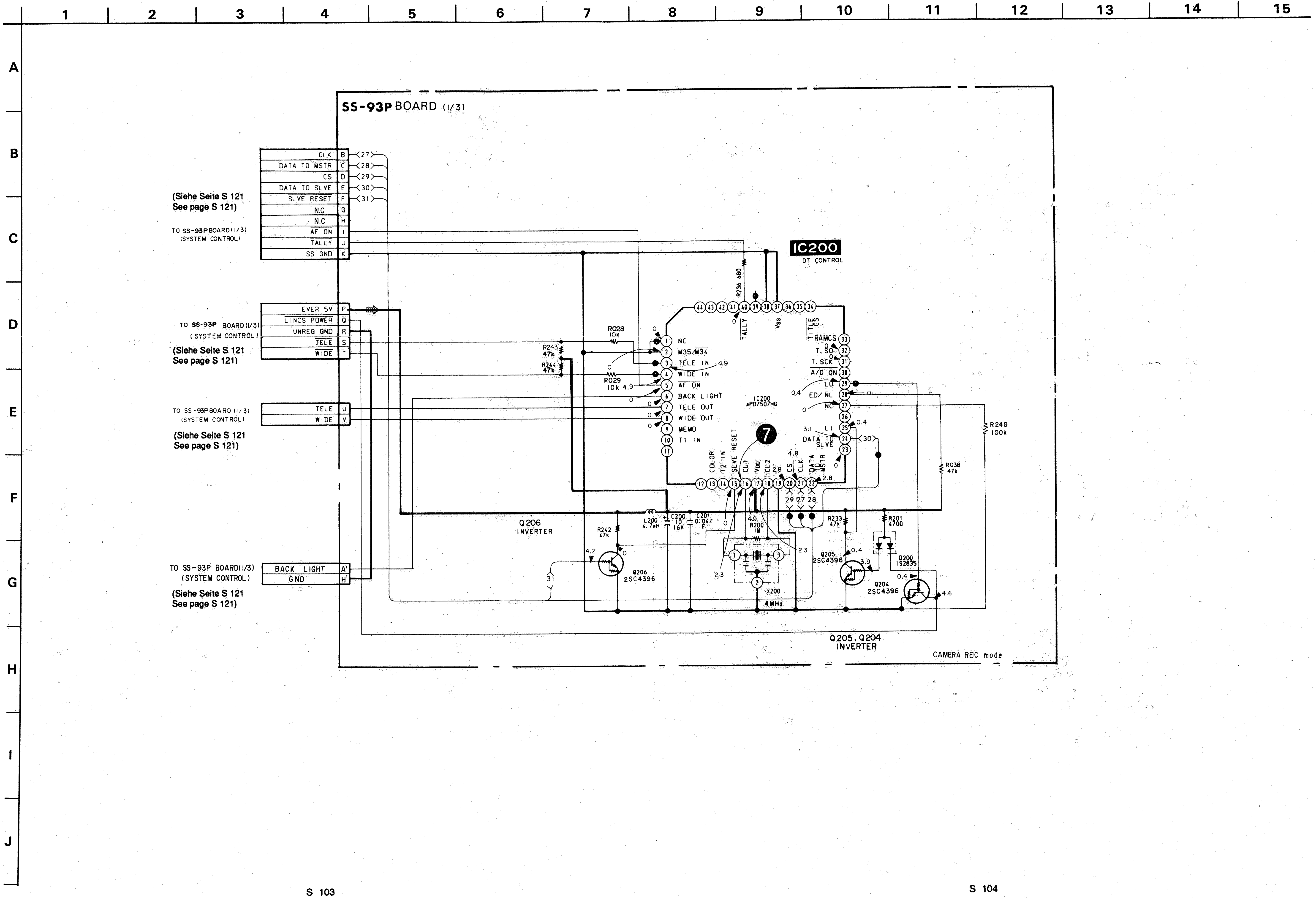
D003	E-15	IC007	F-7	Q054	E-6	Q204	H-7
D004	E-15	IC200	H-10	Q055	F-2	Q205	H-7
D050	I-15	IC301	C-6	Q070	F-3	Q206	G-11
D051	H-15			Q071	F-15	Q302	C-4
D200	I-6	Q001	B-3	Q073	F-15	Q304	B-11
D399	F-14	Q002	B-14	Q074	F-15	Q305	B-5
		Q005	B-13	Q075	C-15	Q307	C-11
IC001	D-2	Q006	G-14	Q076	F-14	Q317	C-11
IC002	B-15	Q007	E-10	Q078	F-14	Q318	C-11
IC003	F-4	Q008	G-14	Q079	F-15	Q319	D-14
IC004	F-5	Q051	I-15	Q080	F-14	Q320	B-4
IC005	B-3	Q052	H-15	Q081	F-2		
IC006	E-7	Q053	G-2	Q090	F-2		


SS-93P BOARD(COMPONENT SIDE)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
45
43
43
44
1
2
3
4
5
6
IC001
IC003
IC004
IC006
IC007
IC301
IC005
Q001
Q305
Q302
Q204
Q205
D200
X001
1-631-592
S 101


SS-93P BOARD
(CONDUCTOR SIDE)
9
10
11
12
13
14
15
16
7
IC200
Q304
Q307
Q317
Q318
Q005
Q002
Q075
Q319
Q007
Q078
Q076
Q080
Q079
Q071
Q073
Q006
Q008
Q206
Q052
Q051
D051
D050
D003
D004
D399
CN004
CN005
CN006
1-631-592
S 102

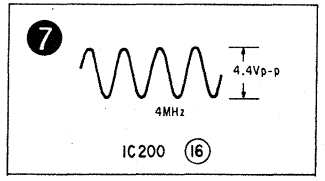
SS-93P (ZOOM CONTROL) SCHEMATIC DIAGRAM

—Ref. No. SS-93P BOARD ; 2,000 series—

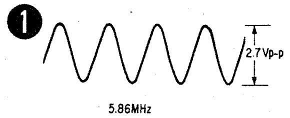


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
SS-93P BOARD (1/3)
CLK
DATA TO MSTR
CS
DATA TO SLVE
SLVE RESET
N.C
N.C
AF ON
TALLY
SS GND
B
C
D
E
F
G
H
I
J
K
27
28
29
30
31
(Siehe Seite S 121
See page S 121)
TO SS-93P BOARD (1/3)
(SYSTEM CONTROL)
EVER 5V
LINCS POWER
UNREG GND
TELE
WIDE
P
Q
R
S
T
TO SS-93P BOARD (1/3)
(SYSTEM CONTROL)
(Siehe Seite S 121
See page S 121)
TELE
WIDE
U
V
TO SS-93P BOARD (1/3)
(SYSTEM CONTROL)
(Siehe Seite S 121
See page S 121)
TO SS-93P BOARD (1/3)
(SYSTEM CONTROL)
BACK LIGHT
GND
A'
H'
(Siehe Seite S 121
See page S 121)
IC200
DT CONTROL
R236 680
TALLY
Vss
TITLE CS
R028
10k
R243
47k
R244
47k
R029
10k
NC
M35/M34
TELE IN
WIDE IN
AF ON
BACK LIGHT
TELE OUT
WIDE OUT
MEMO
T1 IN
IC200
μPD7507HG
RAMCS
T. SO
T. SCK
A/D ON
LD
ED/NL
NC
L1
DATA TO SLVE
COLOR
T2 IN
SLVE RESET
CL1
VDD
CL2
CS
CLK
DATA TO MSTR
7
4.9
4.9
0.4
3.1
4.8
2.6
2.8
29 27 28
R240
100k
R038
47k
Q206
INVERTER
L200
4.7μH
C200
10
16V
C201
0.047
F
R200
1M
R242
47k
4.2
Q206
2SC4396
31
X200
4MHz
2.3
2.3
R233
47k
R201
4700
Q205
2SC4396
0.4
3.9
D200
1S2835
0.4
Q204
2SC4396
4.6
Q205, Q204
INVERTER
CAMERA REC mode

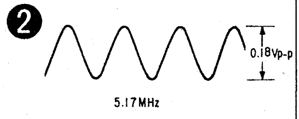
SS-93P BOARD



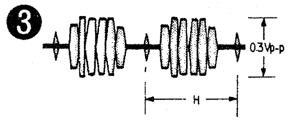
VA-43 BOARD

①


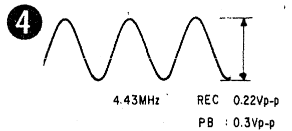
IC250 ⑭ REC/PB

②


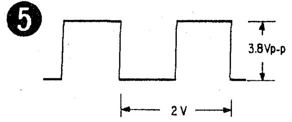
IC360 ① REC/PB

③


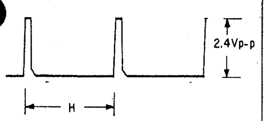
IC360 ④ PB

④


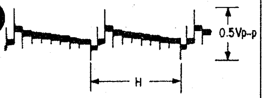
IC360 ⑬ REC/PB

⑤


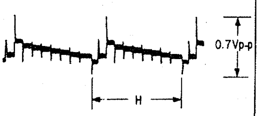
IC360 ⑭ REC/PB

⑥


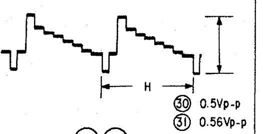
IC360 ⑳ REC/PB

⑦


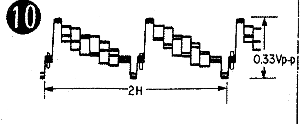
IC360 ㉒ ㉓ PB

⑧


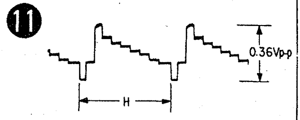
IC360 ㉕ REC

⑨


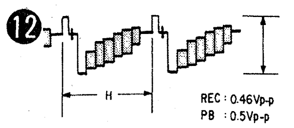
IC360 ㉚ ㉛ PB

⑩


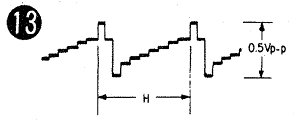
IC360 ㉟ REC

⑪


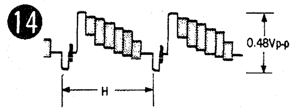
IC360 ㉟ PB

⑫


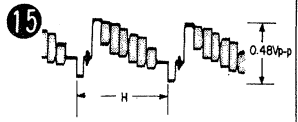
IC360 ㊺ REC/PB ㊼ REC

⑬


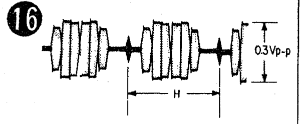
IC360 ㊼ PB

⑭


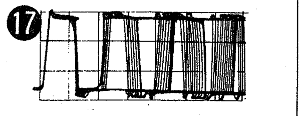
IC360 ㊾ REC

⑮


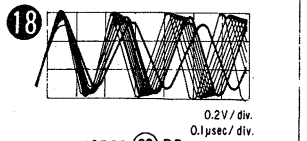
IC360 (56) PB

⑯


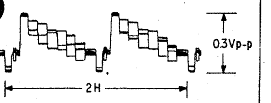
IC360 (57) PB

⑰


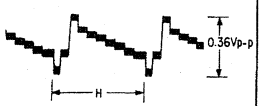
IC360 (59) REC

⑱


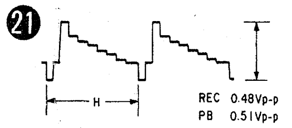
IC360 (60) PB

⑲


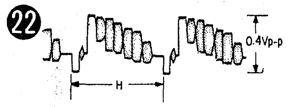
IC361 ⑪ REC

⑳


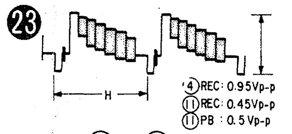
IC361 ⑪ PB

㉑


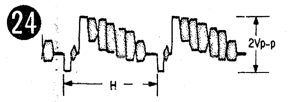
IC365 ⑦ REC/PB

㉒


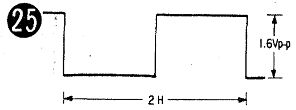
IC362 ② PB

㉓


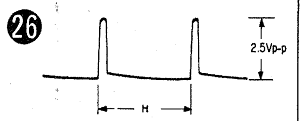
IC362 ④REC ⑪ REC, PB

㉔


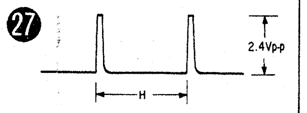
IC362 ⑧ PB

㉕


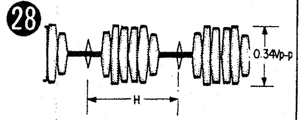
IC363 ④ PB

㉖


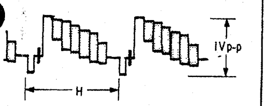
IC363 ⑩ PB

㉗


IC363 ⑪ PB

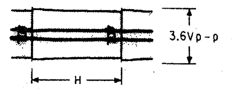
㉘


IC363 ⑮ PB

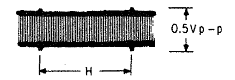
㉙


(COLOR BAR INPUT SIGNAL)
TP362 REC

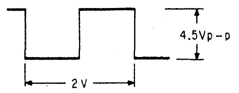
SS-93P BOARD

㊸


IC301 ㉘ , ㉝ REC

㊹


IC301 ⑯ PB

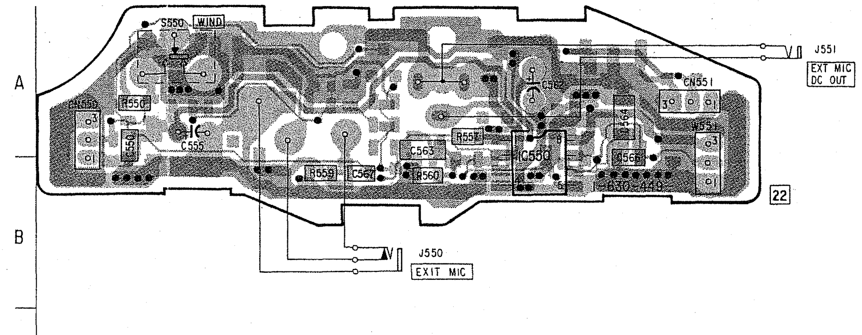
㊺


IC301 ㊴ REC/PB

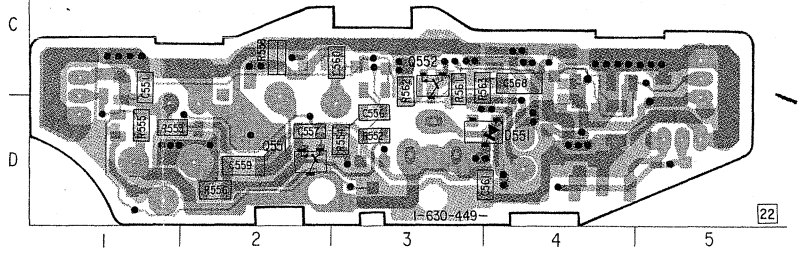
SS-93P (REC/PB AMP), VA-43 (VIDEO/AUDIO SIGNAL PROESS), MC-36P (MIC AMP, START/STOP SWITCH) PRINTED WIRING BOARDS

—Ref. No. SS-93P, VA-43, MC-36P BOARDS ; 2,000 series—

MC-36P BOARD (COMPONENT SIDE)

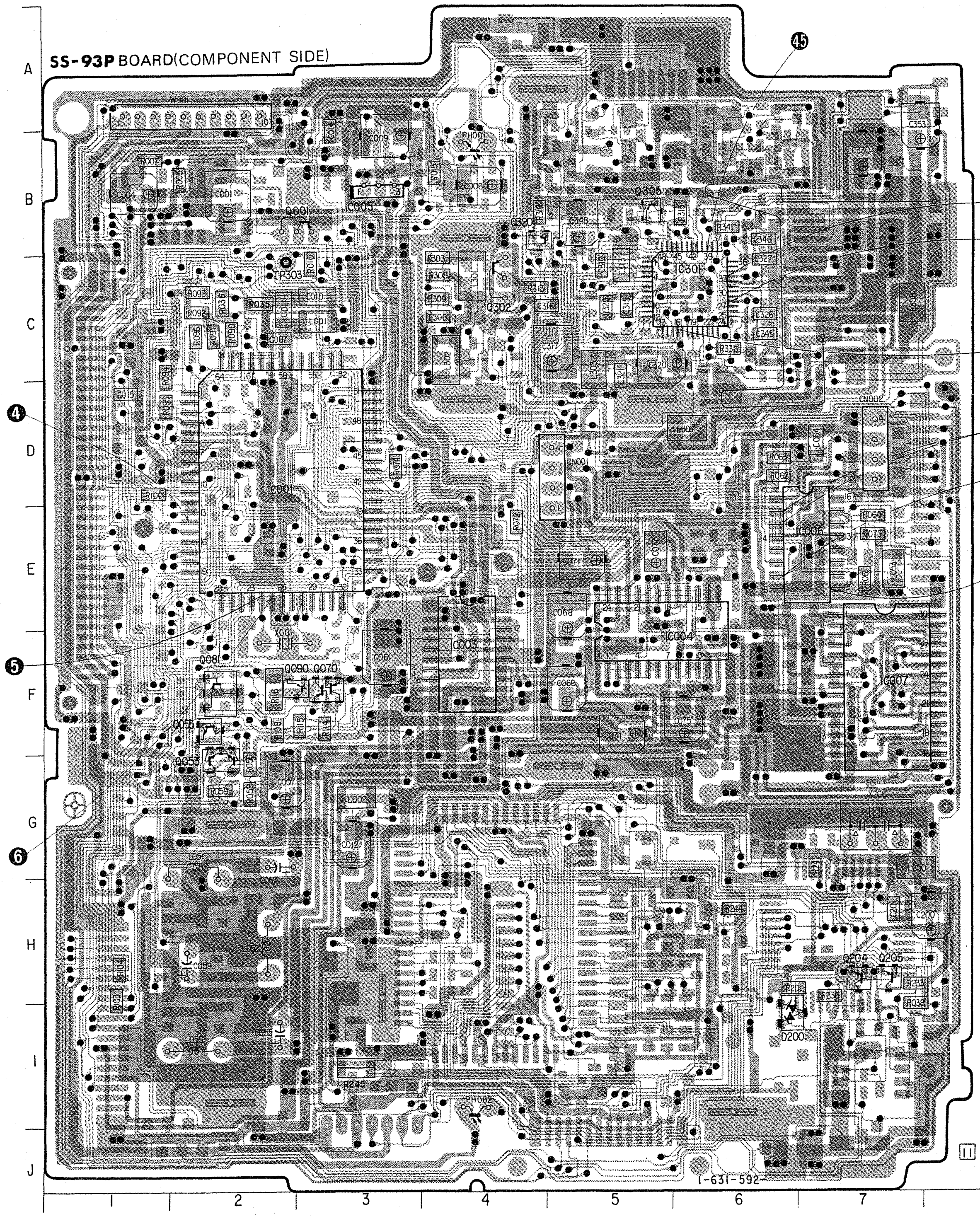

A
B
S550
WIND
J551
EXT MIC DC OUT
CN551
C555
C563
C559
J550
EXIT MIC
22

MC-36P BOARD (CONDUCTOR SIDE)


C
D
Q552
Q551
1-630-449-
22
1
2
3
4
5

D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q204	H-7
Q205	H-7
Q206	G-11
Q302	C-4
Q304	B-11
Q305	B-5
Q307	C-11
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4

SS-93P BOARD(COMPONENT SIDE)


A
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❻
IC301
IC001
IC003
IC004
IC006
IC007
TP303
Q001
Q302
Q305
Q204
Q205
D200
R245
1-631-592-
11
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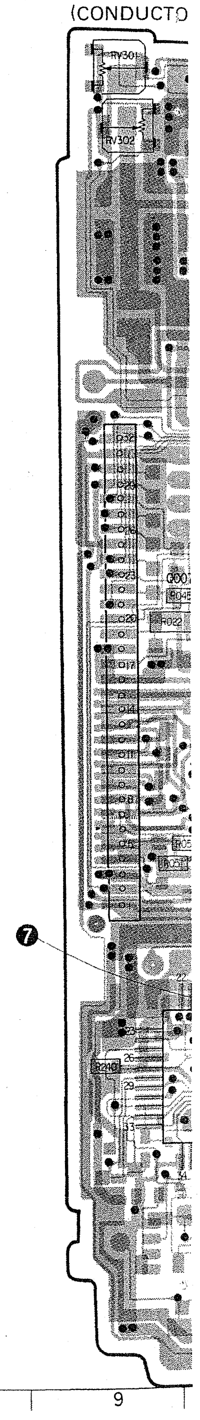
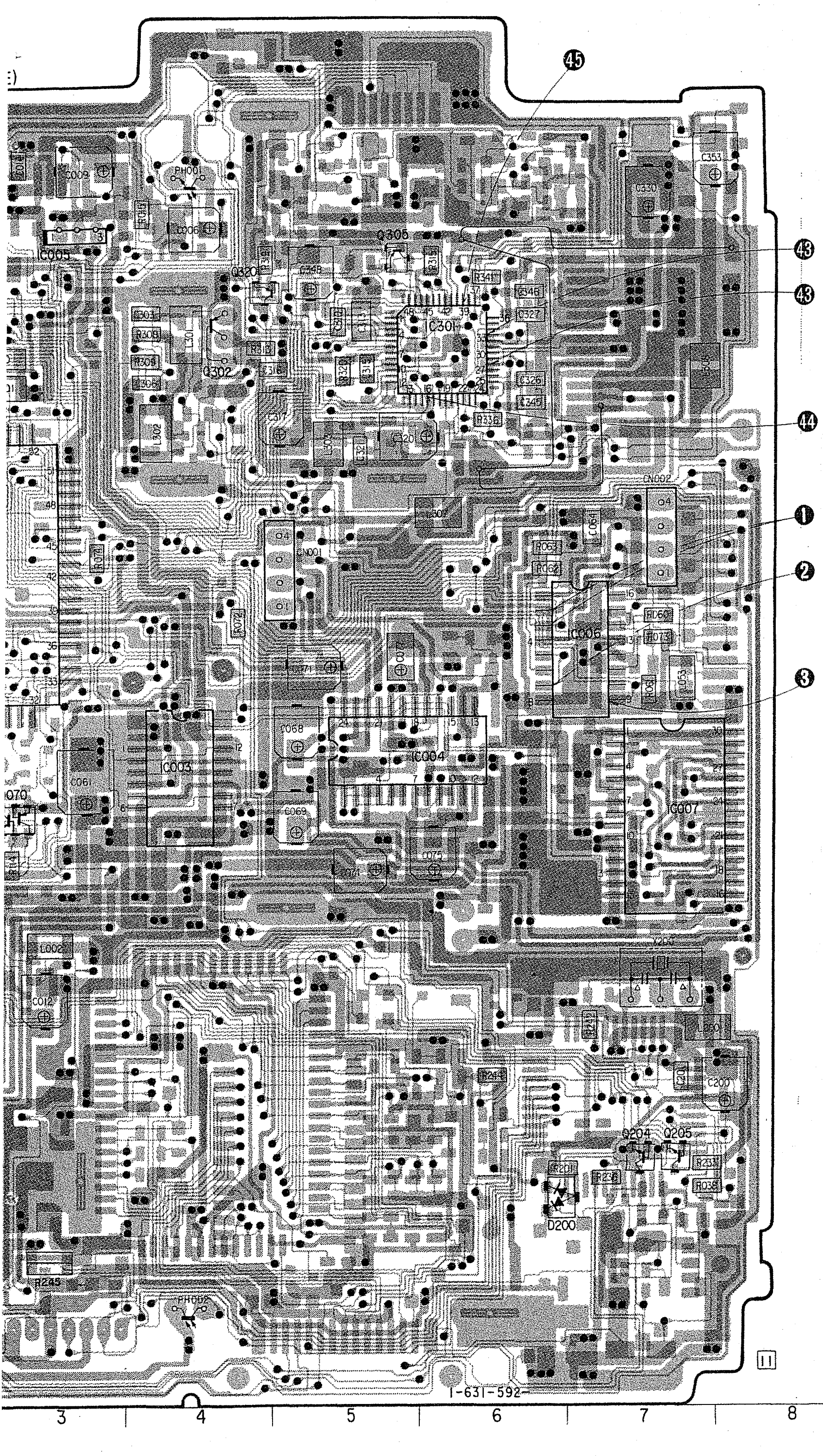
SS-93P BO

(CONDUCTO



RDS


45
43
43
44
1
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3
1-631-592
11
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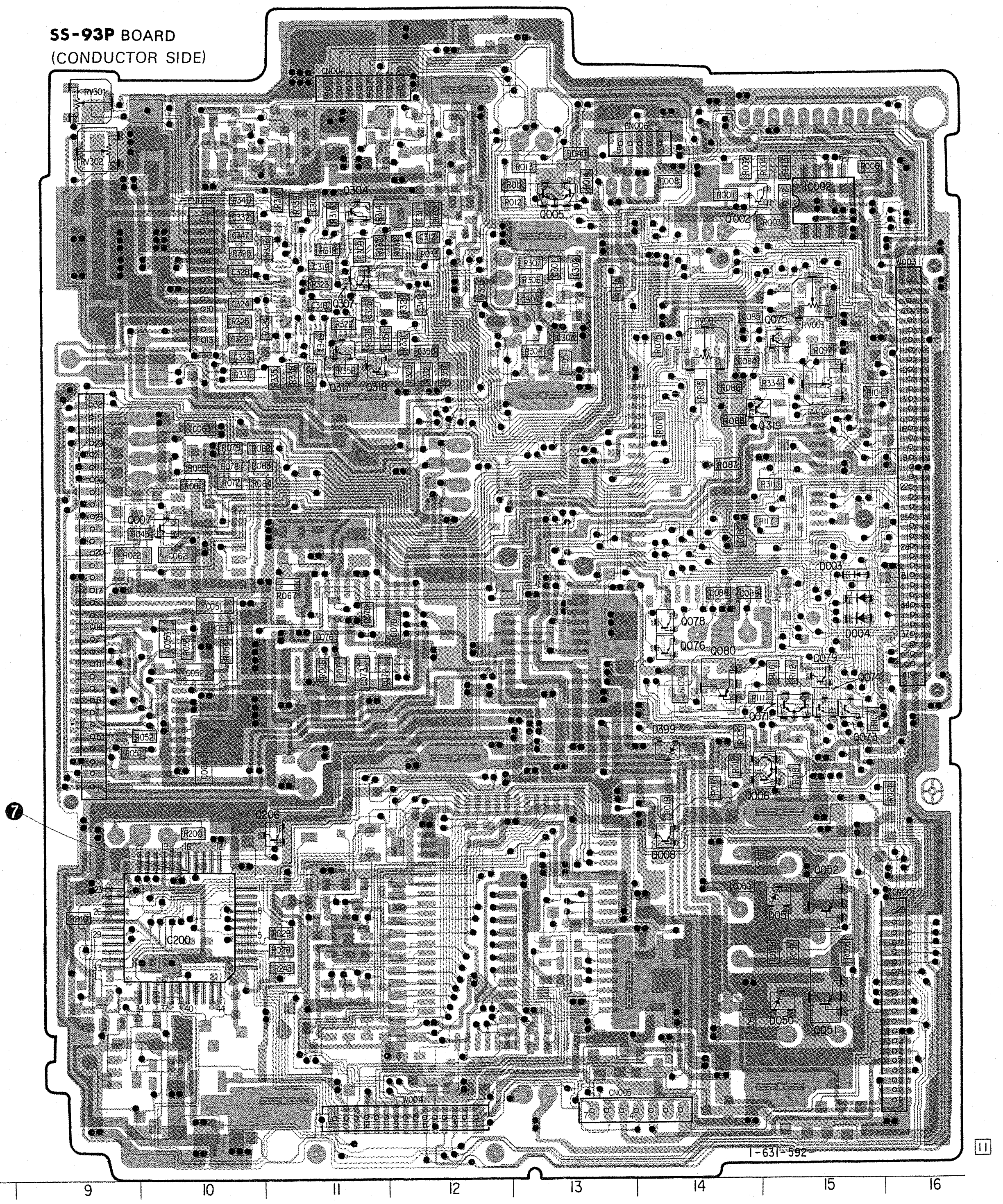
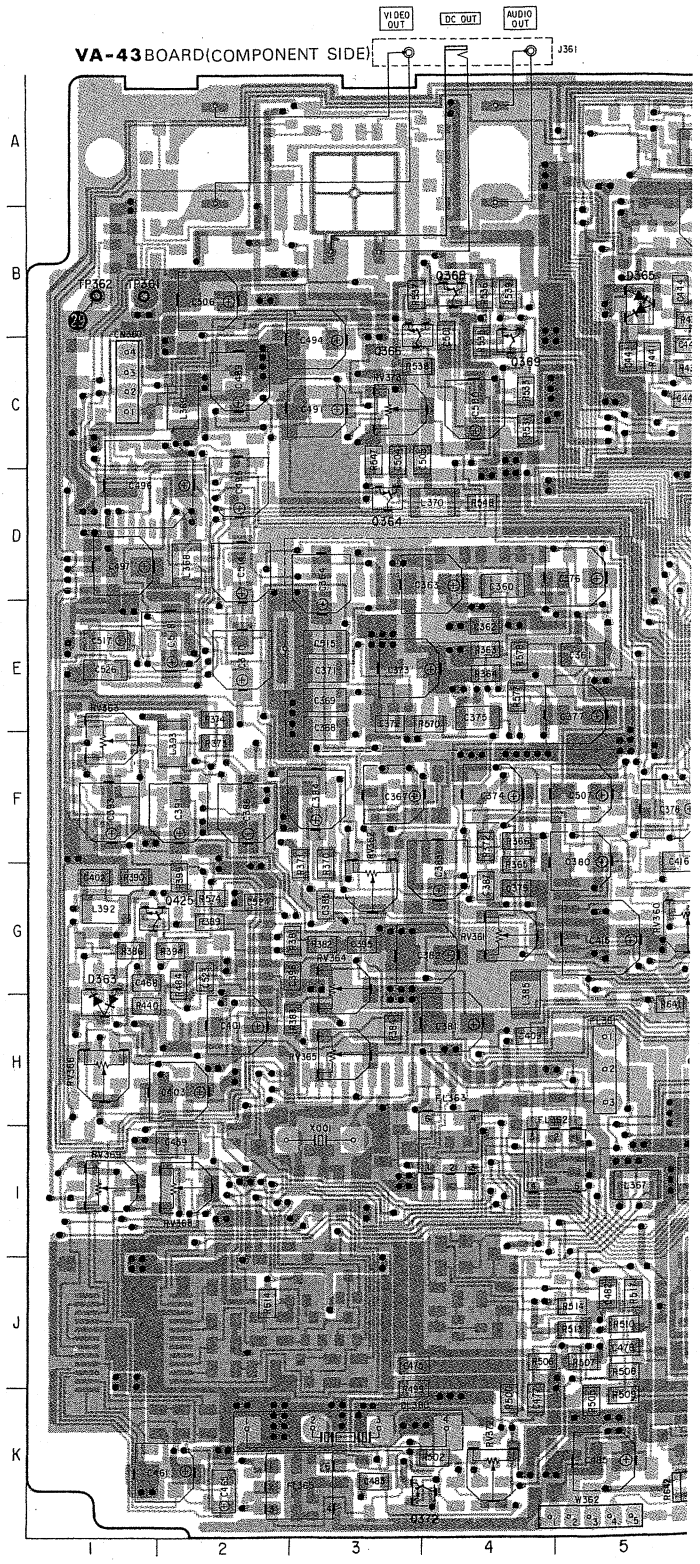
8

SS-93P BOARD
(CONDUCTOR SIDE)


7
1-631-592
11
9
10
11
12
13
14
15
16

D361	E-15
D362	I-17
D363	H-1
D364	I-19
D365	B-5
D368	B-19
D372	F-14
IC250	A-13
IC360	G-18
IC361	E-17
IC362	D-20
IC363	J-20
IC364	C-7
IC365	C-14
IC366	J-15
IC367	F-8
IC368	F-13
IC580	I-8
Q250	B-14
Q251	C-8
Q252	C-8
Q253	B-12
Q254	B-11
Q361	A-19
Q362	A-17
Q363	A-19
Q364	D-3
Q365	C-20
Q366	B-3
Q367	B-17
Q368	B-4
Q369	C-4
Q370	K-18
Q371	K-18
Q372	K-4
Q373	J-16
Q374	J-16
Q375	J-17
Q376	J-16
Q377	I-17
Q378	J-14
Q379	J-14
Q380	K-14
Q381	I-17
Q382	F-18
Q383	F-19
Q384	G-20
Q385	F-20
Q386	F-20
Q387	F-20
Q388	H-20
Q389	G-20
Q390	F-20
Q391	H-19
Q392	I-16
Q393	G-16
Q394	F-16
Q395	J-18
Q396	J-18
Q397	J-18
Q398	J-18
Q399	D-14
Q400	D-8
Q401	D-12
Q402	C-9
Q403	D-7
Q404	B-15
Q405	B-16
Q406	A-16
Q407	B-16
Q408	B-15
Q409	B-15
Q410	J-15
Q411	D-15
Q412	E-15
Q413	J-18
Q414	B-15
Q415	B-15
Q416	E-19
Q417	J-16
Q418	J-16
Q420	F-7
Q421	E-7
Q424	J-18
Q425	G-2
Q426	C-19
Q427	G-19
Q430	H-6
Q433	I-12
Q434	I-12
Q435	J-14
Q436	I-14
Q580	H-12
Q581	I-14
Q582	I-14
TPA	J-7

VA-43 BOARD(COMPONENT SIDE)


VIDEO OUT
DC OUT
AUDIO OUT
J361
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5

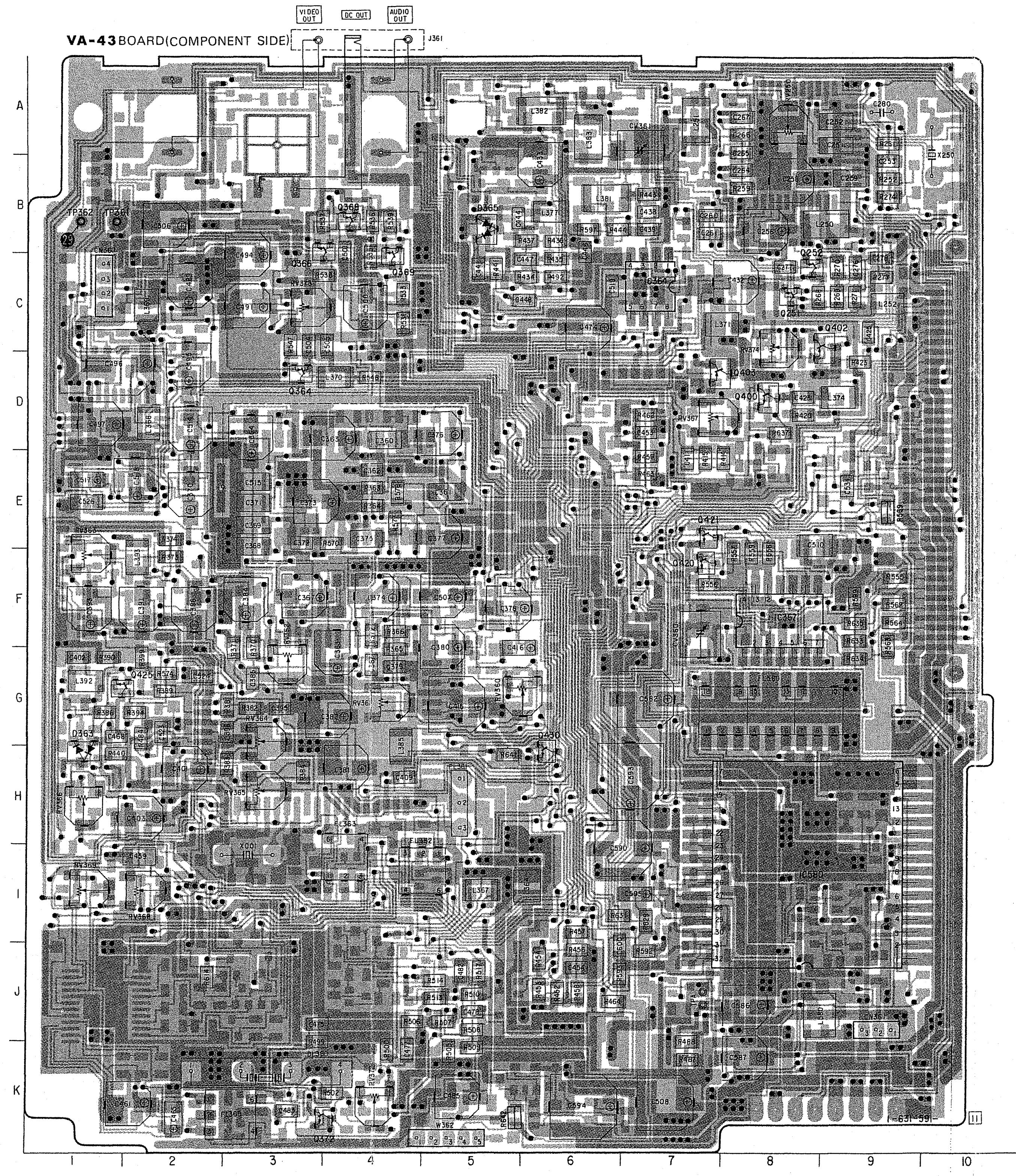
E-15
I-17
H-1
I-19
B-5
B-19
F-14

A-13
G-18
E-17
D-20
J-20
C-7
C-14
J-15
F-8
F-13
I-8

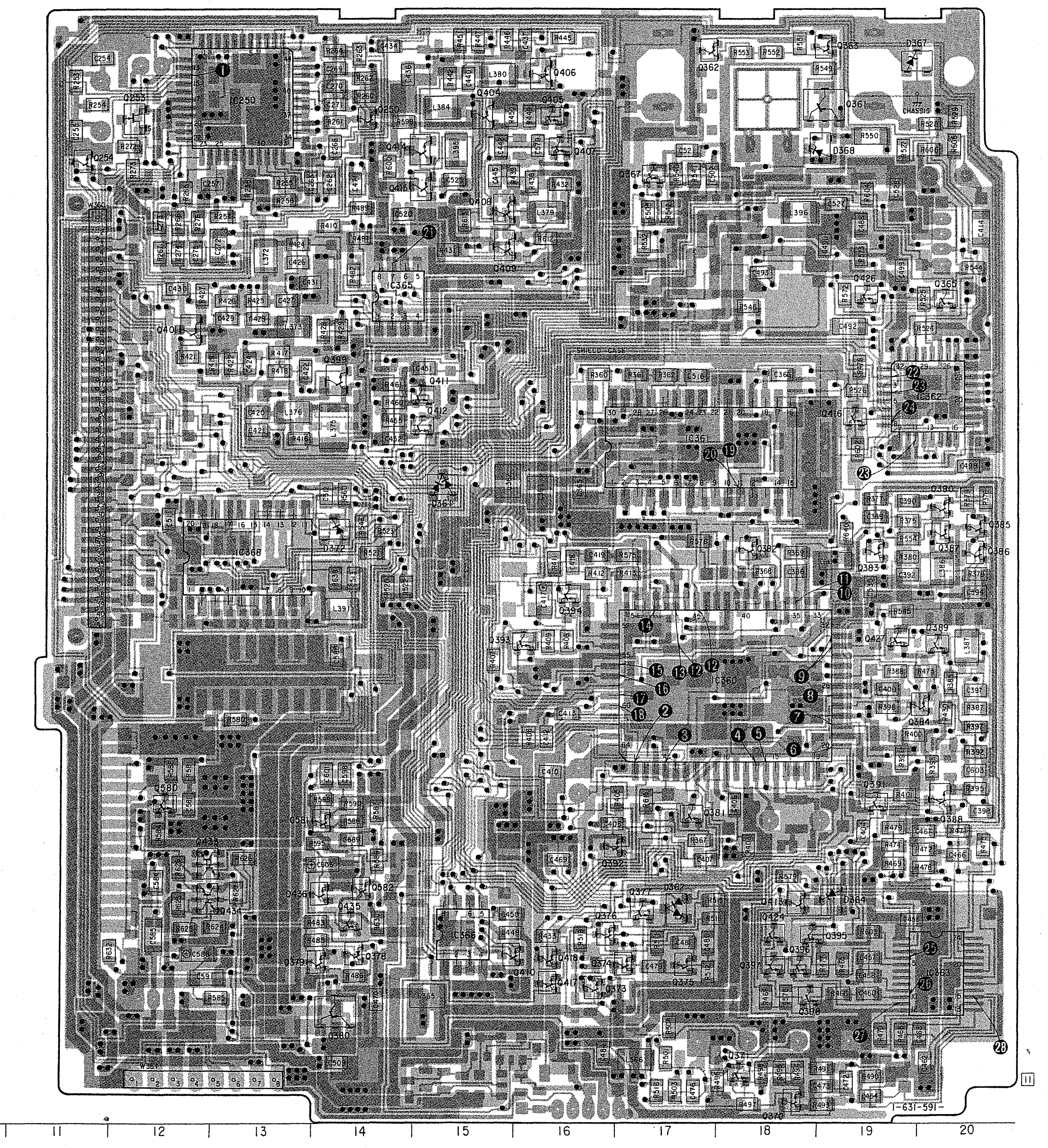
B-14
C-8
C-8
B-12
B-11
A-19
A-17
A-19
D-3
C-20
B-3
B-17
B-4
C-4
K-18
K-18
K-4
J-16
J-16
J-17
J-16
I-17
J-14
J-14
K-14
I-17
F-18
F-19
G-20
F-20
F-20
F-20
H-20
G-20
F-20
H-19
I-16
G-16
F-16
J-18
J-18
J-18
J-18
D-14
D-8
D-12
C-9
D-7
B-15
B-16
A-16
B-16
B-15
B-15
J-15
D-15
E-15
J-18
B-15
B-15
E-19
J-16
J-16
F-7
E-7
J-18
G-2
C-19
G-19
H-6

Q433	I-12
Q434	I-12
Q435	J-14
Q436	I-14
Q580	H-12
Q581	I-14
Q582,	I-14
TPA	J-7

VA-43 BOARD(COMPONENT SIDE)


VIDEO OUT
DC OUT
AUDIO OUT
J361
A
B
C
D
E
F
G
H
I
J
K
1-631-591-11

VA-43 BOARD(CONDUCTOR SIDE)


1-631-591-11
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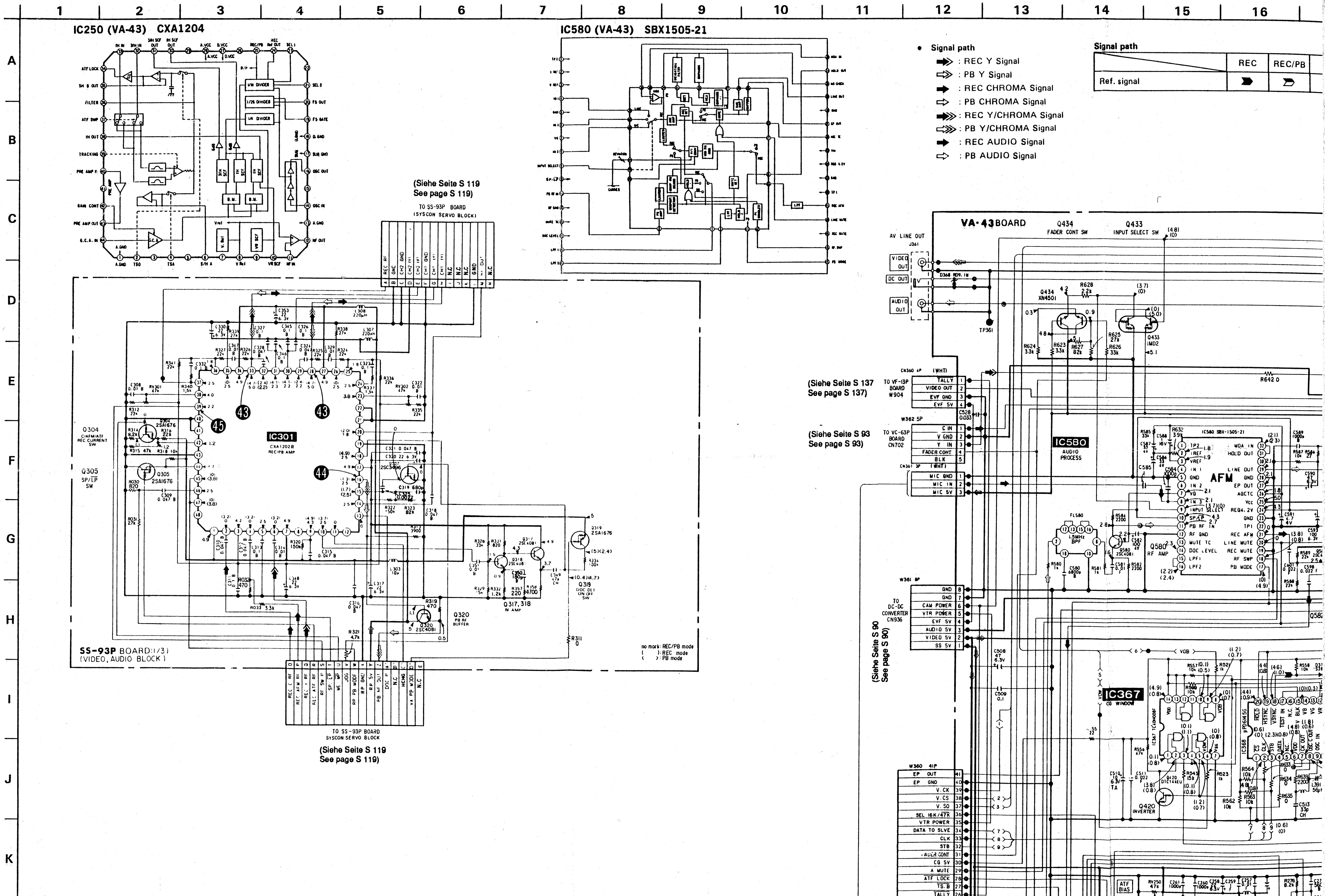
SS-93P (REC/PB AMP), VA-43 (VIDEO/AUDIO SIGNAL PROESS), MC-36P (MIC AMP, START/STOP SWITCH) SCHEMATIC DIAGRAM

—Ref. No. SS-93P, VA-43, MC-36P BOARDS ; 2,000 series—



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9
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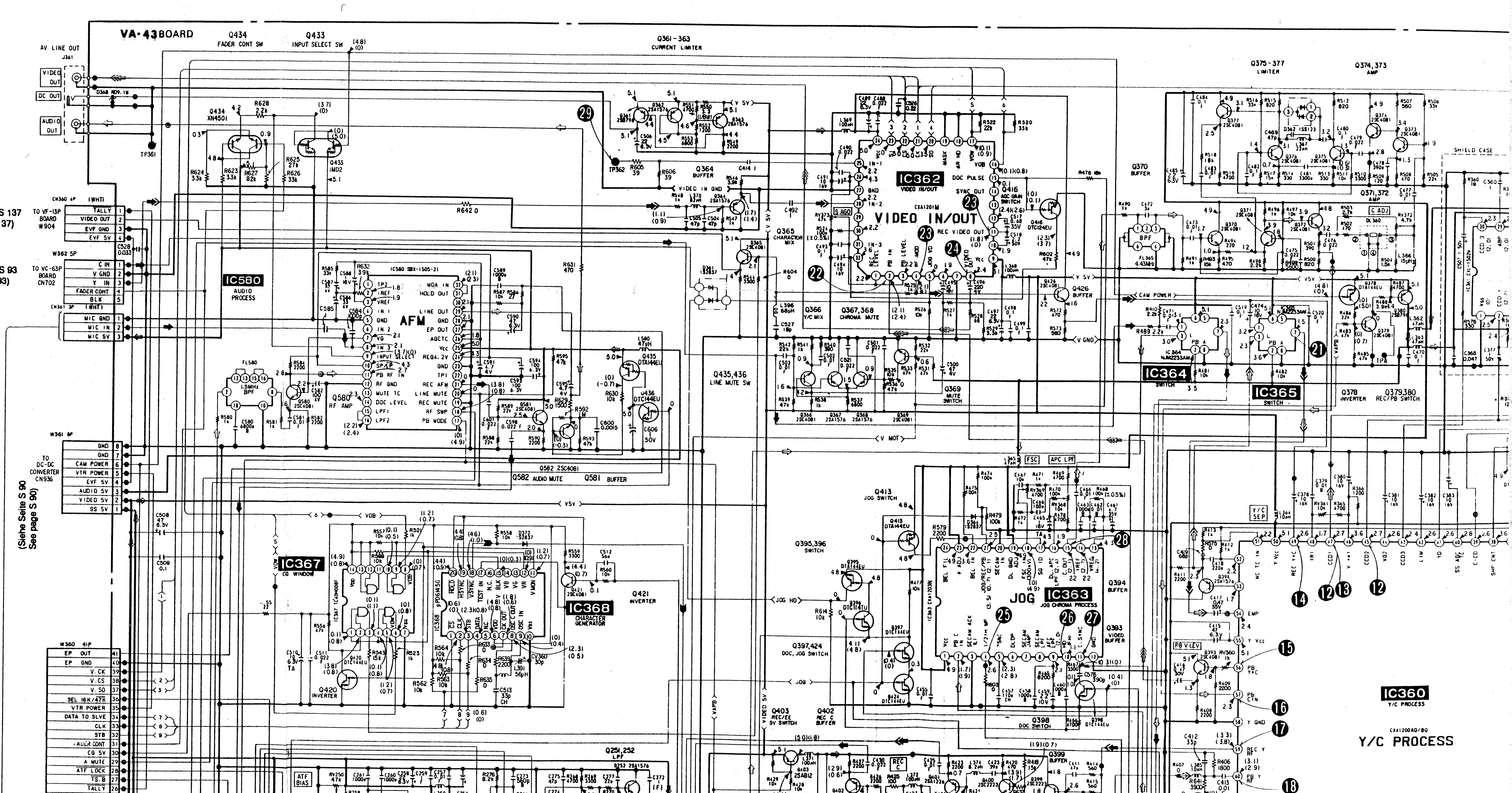
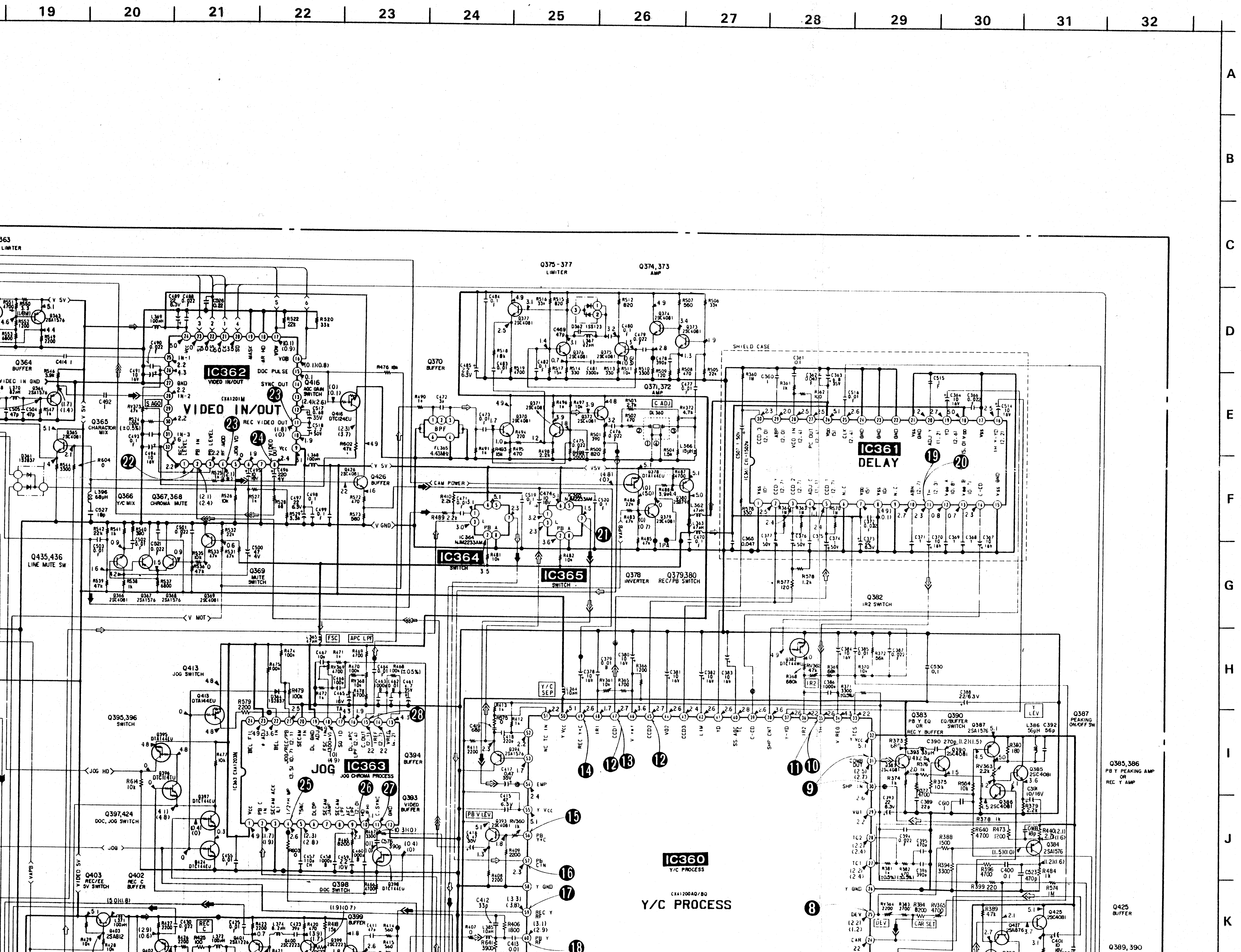
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
K
IC250 (VA-43) CXA1204
ATF LOCK
SH B OUT
FILTER
ATF SWP
FH OUT
TRACKING
PRE AMP B
GAIN CONT
PRE AMP OUT
G.C.A. IN
1/4 DIVIDER
1/26 DIVIDER
1/4 DIVIDER
SEL 2
FS OUT
FS GATE
D. GND
SUB GND
OSC OUT
OSC IN
A.GND
RF OUT
A.GND
TSO
TSA
S/H A
V Ref
VR SCF
RF IN
IC580 (VA-43) SBX1505-21
LPF
(Siehe Seite S 119
See page S 119)
TO SS-93P BOARD
(SYSCON SERVO BLOCK)
REC RF
GND
CH2 GND
CH2 (Y)
CH1 GND
CH1 (Y)
N.C
GND
N.C
Signal path
: REC Y Signal
: PB Y Signal
: REC CHROMA Signal
: PB CHROMA Signal
: REC Y/CHROMA Signal
: PB Y/CHROMA Signal
: REC AUDIO Signal
: PB AUDIO Signal
Signal path
REC
REC/PB
Ref. signal
VA-43 BOARD
Q434
FADER CONT SW
Q433
INPUT SELECT SW
AV LINE OUT
J361
VIDEO OUT
DC OUT
AUDIO OUT
D368 RD9.1B
Q434
XN4501
R628
2.2k
TP361
R624
33k
R623
33k
R627
82k
R625
27k
R626
33k
Q433
IMD2
R642 0
IC301
CXA1202R
REC/PB AMP
43
43
44
45
Q304
C/AFM/ATF
REC CURRENT
SW
Q305
SP/LP
SW
Q302
2SA1676
Q305
2SA1676
L308
220µH
L307
220µH
Q320
2SC3496
Q317, 318
RF AMP
Q319
2SA1676
DOC DET
ON-OFF
SW
Q320
2SC4081
Q320
PB RF
BUFFER
R311
0
SS-93P BOARD(1/3)
(VIDEO, AUDIO BLOCK)
no mark: REC/PB mode
( ): REC mode
〈 〉: PB mode
REC C RF
REC AFM RF
REC Y RF
REC ATF RF
RF SW P
SP, LP
ME
JOG
RP PB MODE
RP GND
RP 5V
PB RF OUT
DOC P
N.C
HCHG
VA PB MODE
N.C
TO SS-93P BOARD
SYSCON SERVO BLOCK
(Siehe Seite S 119
See page S 119)
(Siehe Seite S 137
See page S 137)
TO VF-13P
BOARD
W904
CN360 4P (WHT)
TALLY
VIDEO OUT
EVF GND
EVF 5V
(Siehe Seite S 93
See page S 93)
TO VC-63P
BOARD
CN702
W362 5P
C IN
V GND
Y IN
FADER CONT
BLK
CN361 3P (WHT)
MIC GND
MIC IN
MIC 5V
IC580
AUDIO
PROCESS
IC580 SBX-1505-21
AFM
MOA IN
HOLD OUT
LINE OUT
EP OUT
AGCTC
Vcc
REG4.2V
GND
TP1
REC AFM
LINE MUTE
REC MUTE
RF SWP
PB MODE
TP2
IREF
VREF
IN 1
GND
IN 2
VG
IN 3
INPUT SELECT
SP/LP
PB RF IN
RF GND
MUTE TC
DOC LEVEL
LPF1
LPF2
FL580
1.5MHz
BPF
Q580
2SC4081
Q580
RF AMP
W361 8P
TO
DC-DC
CONVERTER
CN936
GND
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
(Siehe Seite S 90
See page S 90)
IC367
CG WINDOW
IC367 TC4H008F
IC368 µPD6145G
Q420
DTC144EU
Q420
INVERTER
W360 41P
EP OUT
EP GND
V.CK
V.CS
V.SO
SEL 16K/47K
VTR POWER
DATA TO SLVE
CLK
STB
AUDIO CONT
CG 5V
A MUTE
ATF LOCK
TS.B
TALLY
ATF BIAS
RV250
47k

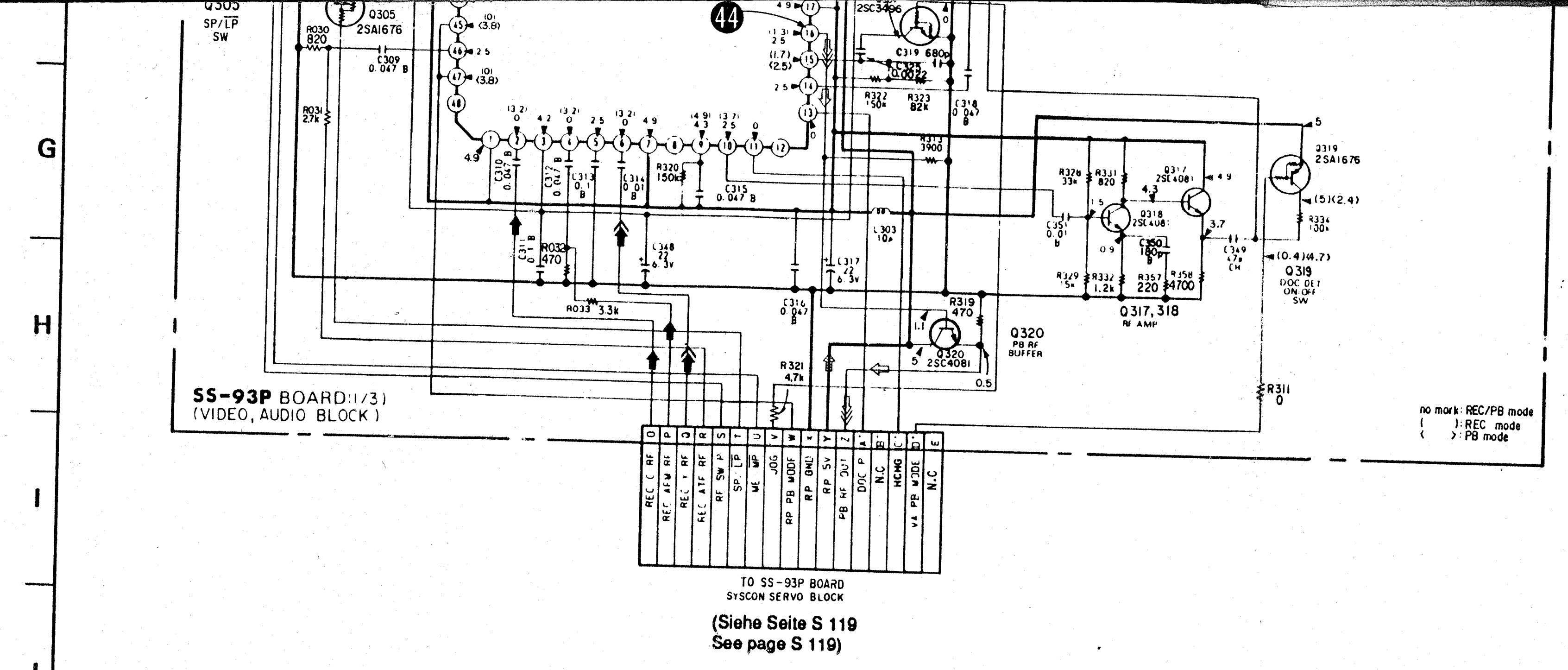
11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27

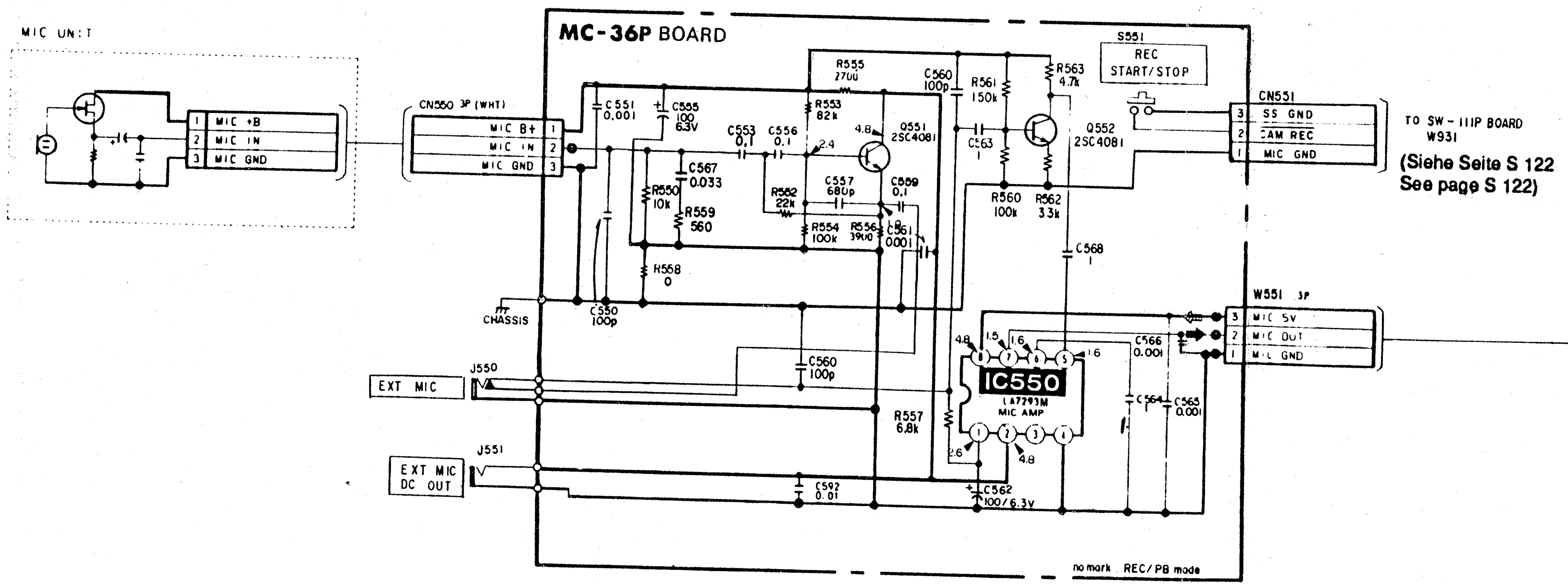
- Signal path
  - ➡ : REC Y Signal
  - ⇨ : PB Y Signal
  - ➡ : REC CHROMA Signal
  - ⇨ : PB CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

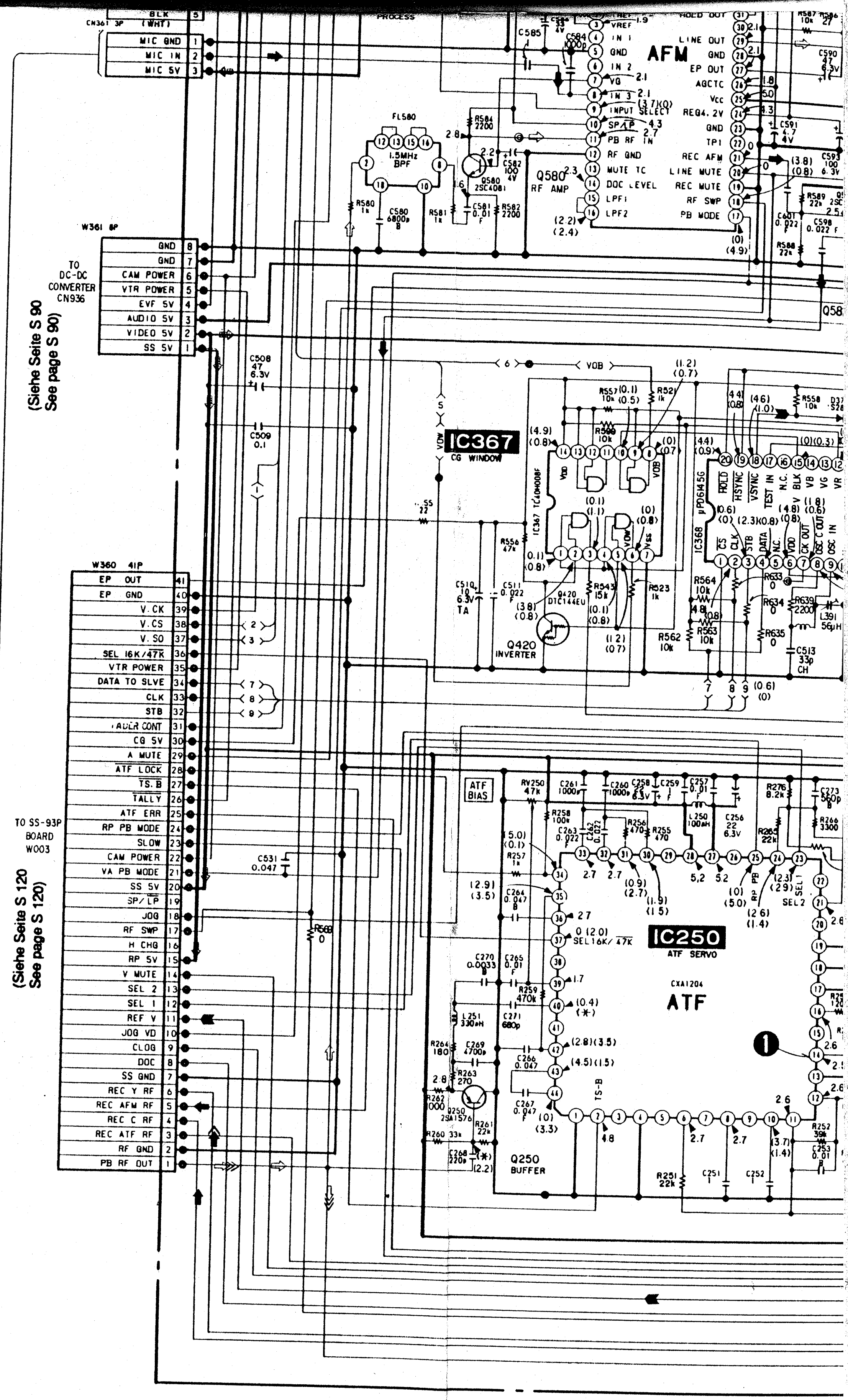
Signal path	REC	REC/PB	PB
Ref. signal	➡	➡	⇨

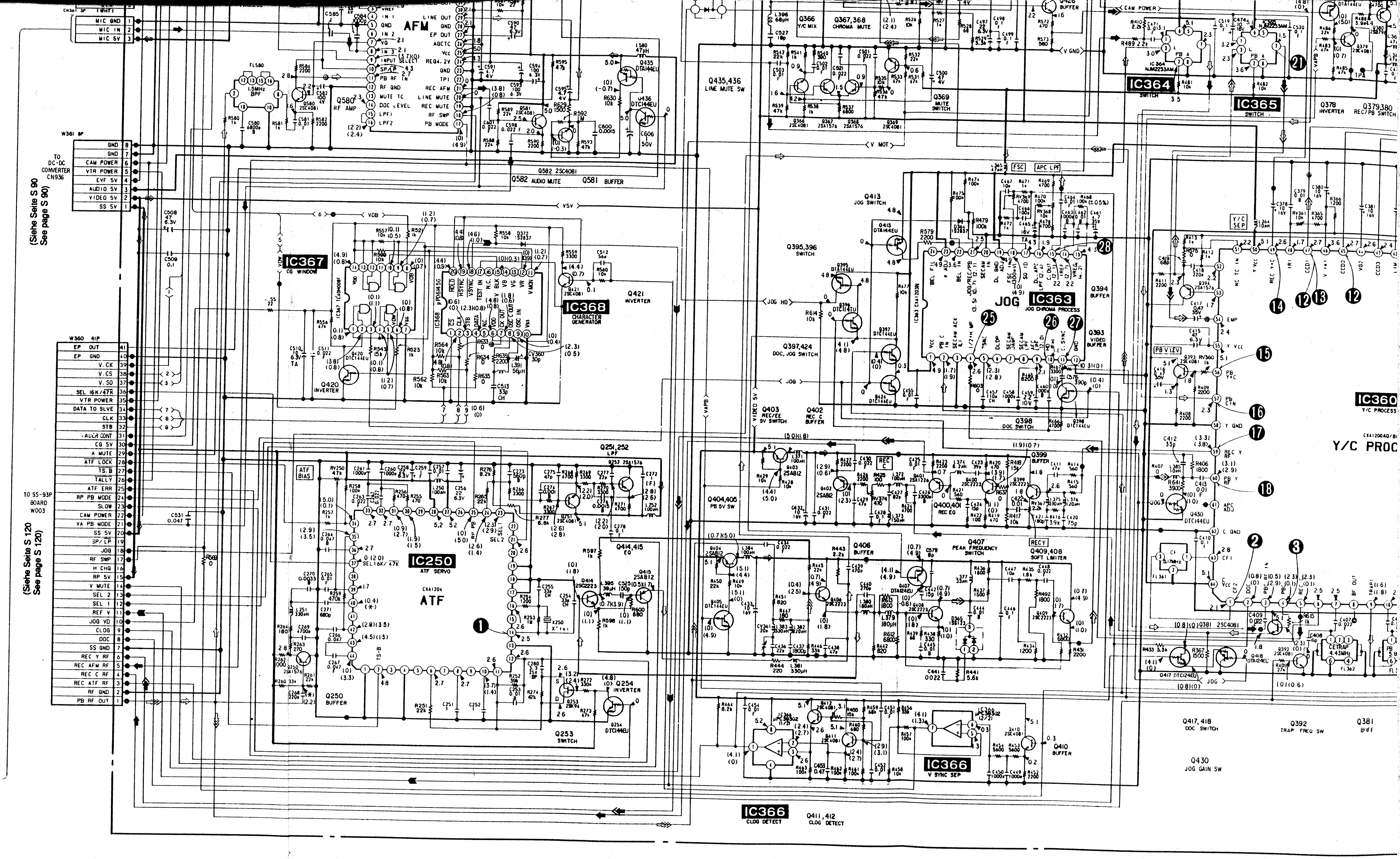

VA-43 BOARD
AV LINE OUT J361
VIDEO OUT
DC OUT
AUDIO OUT
TP361
Q434 FADER CONT SW
Q433 INPUT SELECT SW
Q361-363 CURRENT LIMITER
Q364 BUFFER
Q365 CHARACTOR MIX
TP362
CN360 4P (WHT) TO VF-13P BOARD W904
TALLY
VIDEO OUT
EVF GND
EVF 5V
W362 5P TO VC-63P BOARD CN702
C IN
V GND
Y IN
FADER CONT
BLK
CN361 3P (WHT)
MIC GND
MIC IN
MIC 5V
IC580 AUDIO PROCESS
IC580 SBX-1505-21
AFM
FL580 1.5MHz BPF
Q580 RF AMP
Q581 BUFFER
Q582 AUDIO MUTE
Q435 DTA144EU
Q436 DTC144EU
Q435,436 LINE MUTE SW
W361 8P TO DC-DC CONVERTER CN936
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
(Siehe Seite S 90) See page S 90
IC362 VIDEO IN/OUT
CXA1201M
Q366 Y/C MIX
Q367,368 CHROMA MUTE
Q369 MUTE SWITCH
Q416 AGC GAIN SWITCH
Q426 BUFFER
Q370 BUFFER
FL365 4.43MHz BPF
Q375-377 LIMITER
Q374,373 AMP
Q371,372 AMP
C ADJ
DL360
SHIELD CASE
IC364 NJM2233AM SWITCH
IC365 SWITCH
Q378 INVERTER
Q379,380 REC/PB SWITCH
IC367 CG WINDOW
IC368 CHARACTER GENERATOR
Q420 INVERTER
Q421 INVERTER
W360 41P
EP OUT
EP GND
V.CK
V.CS
V.SO
SEL 16K/47K
VTR POWER
DATA TO SLVE
CLK
STB
FADER CONT
CG 5V
A MUTE
ATF LOCK
TS.B
TALLY
Q413 JOG SWITCH
Q395,396 SWITCH
Q397,424 DOC, JOG SWITCH
IC363 JOG CHROMA PROCESS
CXA1202N
Q394 BUFFER
Q393 VIDEO BUFFER
Q398 DOC SWITCH
Q399 BUFFER
Q403 REC/EE 5V SWITCH
Q402 REC C BUFFER
Q251,252 LPF
ATF BIAS
FSC
APC LPF
Y/C SEP
PB V LEV
IC360 Y/C PROCESS
CXA1200AQ/BQ
Y/C PROCESS
⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙

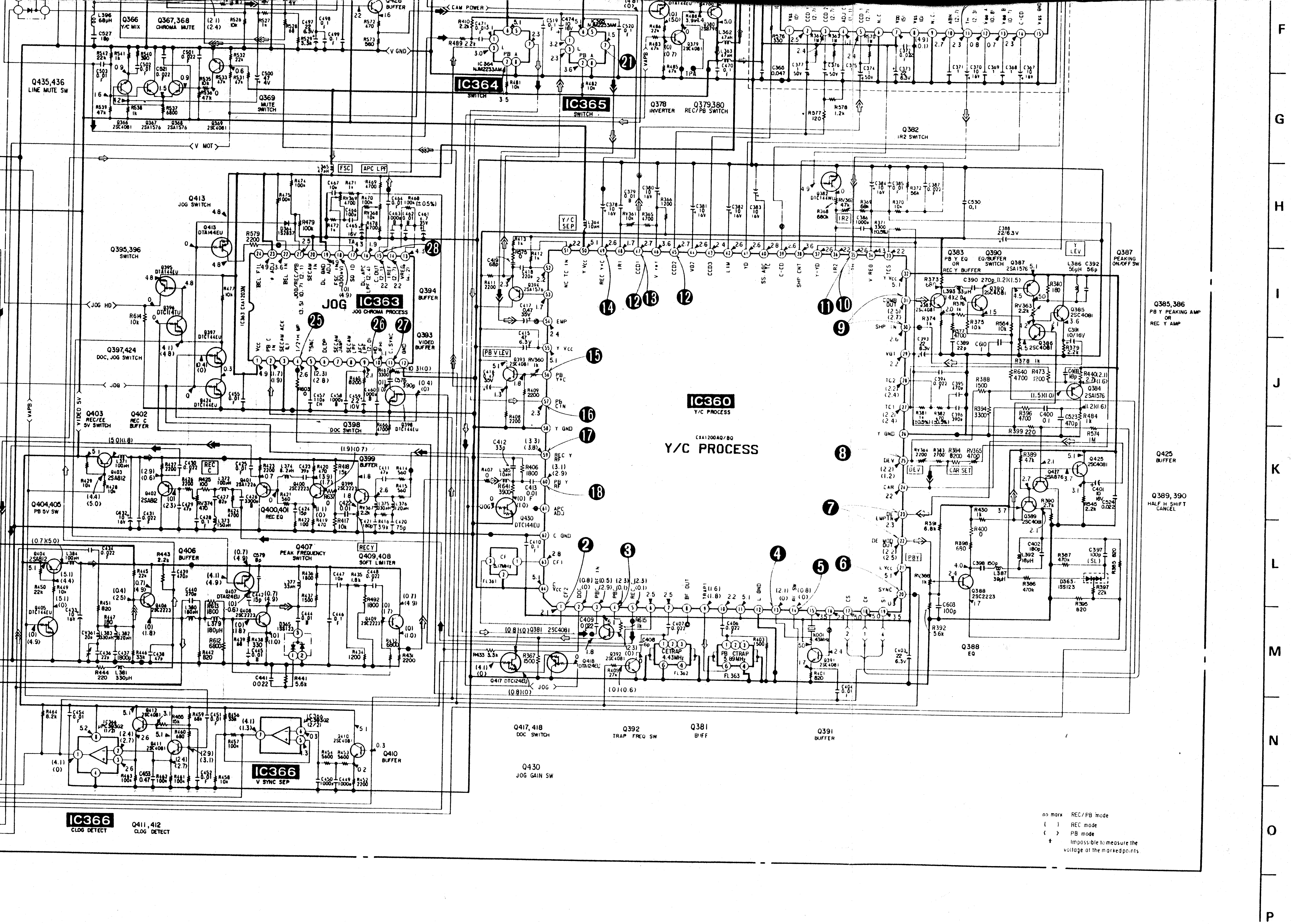

19
20
21
22
23
24
25
26
27
28
29
30
31
32
A
B
C
D
E
F
G
H
I
J
K
363
LIMITER
Q364
BUFFER
Q365
CHARACTOR MIX
Q366
Y/C MIX
Q367,368
CHROMA MUTE
Q369
MUTE SWITCH
Q435,436
LINE MUTE SW
IC362
VIDEO IN/OUT
CXA1201M
VIDEO IN/OUT
Q416
AGC GAIN SWITCH
Q426
BUFFER
Q370
BUFFER
BPF
FL365
4.43MHz
Q375-377
LIMITER
Q374,373
AMP
Q371,372
AMP
C ADJ
DL360
SHIELD CASE
IC361
DELAY
IC364
SWITCH
IC365
SWITCH
Q378
INVERTER
Q379,380
REC/PB SWITCH
Q382
IR2 SWITCH
V 5V
V GND
CAM POWER
V MOT
FSC
APC LPF
Y/C SEP
Q413
JOG SWITCH
Q395,396
SWITCH
Q397,424
DOC, JOG SWITCH
JOG HD
JOG
IC363
JOG
JOG CHROMA PROCESS
Q394
BUFFER
Q393
VIDEO BUFFER
Q398
DOC SWITCH
Q399
BUFFER
Q403
REC/EE
5V SWITCH
Q402
REC C
BUFFER
PB Y LEV
IC360
Y/C PROCESS
CXA1200AQ/BQ
Y/C PROCESS
Q383
PB Y EQ
OR
REC Y BUFFER
Q390
EQ/BUFFER
SWITCH
Q387
PEAKING
ON/OFF SW
Y LEV
Q385,386
PB Y PEAKING AMP
OR
REC Y AMP
Q384
Q425
BUFFER
Q389,390
DEV
CAR SET
IR2


G
H
I
J
K
L
M
N
O
P
Q305 SP/LP SW
Q305 2SA1676
44
SS-93P BOARD(1/3)
(VIDEO, AUDIO BLOCK)
Q317,318 RF AMP
Q319 2SA1676
Q319 DOC DET ON/OFF SW
Q320 PB RF BUFFER
Q320 2SC4081
no mark: REC/PB mode
( ): REC mode
( ): PB mode
TO SS-93P BOARD SYSCON SERVO BLOCK
(Siehe Seite S 119
See page S 119)


MIC UNIT
MC-36P BOARD
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
S551 REC START/STOP
CN551
SS GND
CAM REC
MIC GND
TO SW-111P BOARD W931
(Siehe Seite S 122
See page S 122)
Q551 2SC4081
Q552 2SC4081
IC550
LA7293M MIC AMP
W551 3P
MIC 5V
MIC OUT
MIC GND
EXT MIC
J550
J551
EXT MIC DC OUT
CHASSIS
no mark REC/PB mode

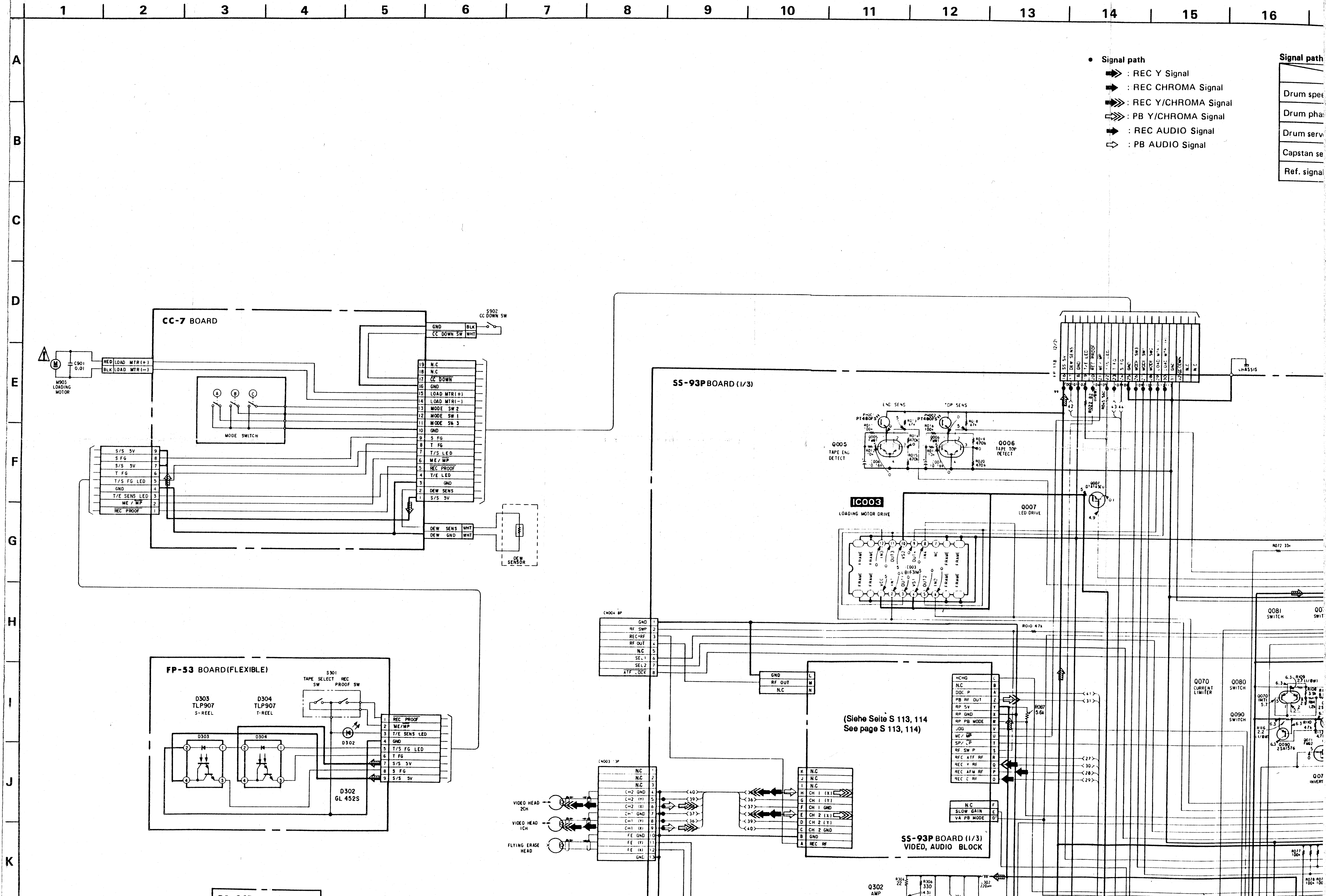

CN361 3P (WHT)
MIC GND
MIC IN
MIC 5V
AFM
Q580 RF AMP
FL580 1.5MHz BPF
W361 8P
TO DC-DC CONVERTER CN936
(Siehe Seite S 90
See page S 90)
GND
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
IC367 CG WINDOW
IC368
Q420 INVERTER
W360 41P
TO SS-93P BOARD W003
(Siehe Seite S 120
See page S 120)
EP OUT
EP GND
V.CK
V.CS
V.SO
SEL 16K/47K
VTR POWER
DATA TO SLVE
CLK
STB
AUDIO CONT
CG 5V
A MUTE
ATF LOCK
TS.B
TALLY
ATF ERR
RP PB MODE
SLOW
CAM POWER
VA PB MODE
SS 5V
SP/LP
JOG
RF SWP
H CHG
RP 5V
V MUTE
SEL 2
SEL 1
REF V
JOG VD
CLOG
DOC
SS GND
REC Y RF
REC AFM RF
REC C RF
REC ATF RF
RF GND
PB RF OUT
IC250 ATF SERVO
CXA1204 ATF
ATF BIAS
Q250 BUFFER
1


MIC GND
MIC IN
MIC 5V
AFM
FL580
1.5MHz BPF
Q580 RF AMP
Q582 AUDIO MUTE
Q581 BUFFER
Q435,436 LINE MUTE SW
Q366 Y/C MIX
Q367,368 CHROMA MUTE
Q369 MUTE SWITCH
IC364 SWITCH
NJM2233AM
IC365 SWITCH
Q378 INVERTER
Q379380 REC/PB SWITCH
W361 8P
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
TO DC-DC CONVERTER CN936
(Siehe Seite S 90 See page S 90)
IC367 CG WINDOW
IC368 CHARACTER GENERATOR
µPD6145G
Q420 INVERTER
Q421 INVERTER
Q413 JOG SWITCH
Q395,396 SWITCH
Q397,424 DOC, JOG SWITCH
IC363 JOG CHROMA PROCESS
JOG
CXA1203N
Q394 BUFFER
Q393 VIDEO BUFFER
Q398 DOC SWITCH
IC360 Y/C PROCESS
CXA1200AQ
Y/C PROC
W360 41P
EP OUT
EP GND
V.CK
V.CS
V.SO
SEL 16K/47K
VTR POWER
DATA TO SLVE
CLK
STB
AUDIO CONT
CG 5V
A MUTE
ATF LOCK
TS.B
TALLY
ATF ERR
RP PB MODE
SLOW
CAM POWER
VA PB MODE
SS 5V
SP/LP
JOG
RF SWP
H CHG
RP 5V
V MUTE
SEL 2
SEL 1
REF V
JOG VD
CLOG
DOC
SS GND
REC Y RF
REC AFM RF
REC C RF
REC ATF RF
RF GND
PB RF OUT
TO SS-93P BOARD W003
(Siehe Seite S 120 See page S 120)
ATF BIAS
IC250 ATF SERVO
CXA1204
ATF
Q250 BUFFER
Q251,252 LPF
Q414,415 EQ
Q253 SWITCH
Q254 INVERTER
Q403 REC/EE 5V SWITCH
Q402 REC C BUFFER
Q404,405 PB 5V SW
Q400,401 REC EQ
Q399 BUFFER
Q406 BUFFER
Q407 PEAK FREQUENCY SWITCH
Q409,408 SOFT LIMITER
IC366 V SYNC SEP
Q410 BUFFER
IC366 CLOG DETECT
Q411,412 CLOG DETECT
Q417,418 DOC SWITCH
Q392 TRAP FREQ SW
Q381 BUFF
Q430 JOG GAIN SW
4.43MHz
CETRAP


IC360
Y/C PROCESS
CXA1200AQ/BQ
IC363
JOG
JOG CHROMA PROCESS
IC364
SWITCH
IC365
SWITCH
IC366
V SYNC SEP
IC366
CLOG DETECT
Q411,412
CLOG DETECT
Q435,436
LINE MUTE SW
Q366
Y/C MIX
Q367,368
CHROMA MUTE
Q369
MUTE SWITCH
Q378
INVERTER
Q379,380
REC/PB SWITCH
Q382
IR2 SWITCH
Q413
JOG SWITCH
Q395,396
SWITCH
Q397,424
DOC, JOG SWITCH
Q403
REC/EE 5V SWITCH
Q402
REC C BUFFER
Q398
DOC SWITCH
Q394
BUFFER
Q393
VIDEO BUFFER
Q399
BUFFER
Q400,401
REC EQ
Q404,405
PB 5V SW
Q406
BUFFER
Q407
PEAK FREQUENCY SWITCH
Q409,408
SOFT LIMITER
Q410
BUFFER
Q417,418
DOC SWITCH
Q392
TRAP FREQ SW
Q381
BUFF
Q391
BUFFER
Q430
JOG GAIN SW
Q383
PB Y EQ OR REC Y BUFFER
Q390
EQ/BUFFER SWITCH
Q387
PEAKING ON/OFF SW
Q385,386
PB Y PEAKING AMP OR REC Y AMP
Q425
BUFFER
Q389,390
HALF H SHIFT CANCEL
Q388
EQ
V MOT
V GND
JOG HD
JOG
VAPB
VIDEO 5V
CAM POWER
FSC
APC LPF
Y/C SEP
PB V LEV
REC C
RECY
DEV
CAR SET
PBY
Y LEV
IR2
CF TRAP 4.43MHz
PB CTRAP 5.89MHz
X001 4.43MHz
no mark REC/PB mode
( ) REC mode
( ) PB mode
impossible to measure the voltage at the marked points
F
G
H
I
J
K
L
M
N
O
P

SS-93P (SERVO/SYSTEM CONTROL), SW-111P (START/STOP SWITCH, STANDBY SWITCH, IN/OUT JACK), ZM-10P (ZOOM SWITCH), PA-24P (POWER), CC-7 (MODE SWITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) SCHEMATIC DIAGRAM

—Ref. No. SS-93P BOARD ; 2,000 series, SW-111P, ZM-10P, PA-24P, CC-7, FP-53 BOARDS ; 3,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
K
CC-7 BOARD
S902
CC DOWN SW
GND
CC DOWN SW
BLK
WHT
M903
LOADING
MOTOR
C901
0.01
RED
BLK
LOAD MTR(+)
LOAD MTR(−)
A
B
C
MODE SWITCH
19 N.C
18 N.C
17 CC DOWN
16 GND
15 LOAD MTR(+)
14 LOAD MTR(−)
13 MODE SW 2
12 MODE SW 1
11 MODE SW 3
10 GND
9 S FG
8 T FG
7 T/S LED
6 ME/MP
5 REC PROOF
4 T/E LED
3 GND
2 DEW SENS
1 S/S 5V
S/S 5V 9
S FG 8
S/S 5V 7
T FG 6
T/S FG LED 5
GND 4
T/E SENS LED 3
ME/MP 2
REC PROOF 1
DEW SENS
DEW GND
WHT
DEW SENSOR
FP-53 BOARD(FLEXIBLE)
S301
TAPE SELECT SW
REC PROOF SW
D303
TLP907
S-REEL
D304
TLP907
T-REEL
D302
D302
GL 452S
1 REC PROOF
2 ME/MP
3 T/E SENS LED
4 GND
5 T/S FG LED
6 T FG
7 S/S 5V
8 S FG
9 S/S 5V
SS-93P BOARD (1/3)
END SENS
TOP SENS
PH001
PT480FS
PH002
PT480FS
R011 100k
R012 10k
R013 47k
R014 470k
R015 470k
R016 100k
R017 10k
R018 47k
R019 470k
R020 470k
C006 10 16V
C007 10 16V
Q005
TAPE END
DETECT
Q006
TAPE TOP
DETECT
IC003
LOADING MOTOR DRIVE
IC003
LB1631M
FRAME
IN3
OUT3
VS2
OUT4
IN4
NC
VCC
IN1
OUT1
VS1
OUT2
IN2
Q007
DTA143EU
Q007
LED DRIVE
4.9
FP 118 (2/2)
16 SS 5V
17 DEW SENS
18 GND
19 T/E LED
20 REC PROOF
21 ME/MP
22 T/S LED
23 T FG
24 S FG
25 GND
26 MODE SW3
27 MODE SW1
28 MODE SW2
29 LOAD MTR(−)
30 LOAD MTR(+)
31 GND
32 CC DOWN
N.C
N.C
R022 82 (1/8W)
R045 560
CHASSIS
R072 33k
R010 47k
CN004 8P
GND 1
RF SWP 2
REC•RF 3
RF OUT 4
N.C 5
SEL 1 6
SEL 2 7
ATF LOCK 8
GND L
RF OUT M
N.C N
CN003 13P
N.C 1
N.C 2
N.C 3
CH2 GND 4
CH2 (Y) 5
CH2 (X) 6
CH1 GND 7
CH1 (Y) 8
CH1 (X) 9
FE GND 10
FE (Y) 11
FE (X) 12
GND 13
VIDEO HEAD
2CH
VIDEO HEAD
1CH
FLYING ERASE
HEAD
K N.C
J N.C
I N.C
H CH 1 (X)
G CH 1 (Y)
F CH 1 GND
E CH 2 (X)
D CH 2 (Y)
C CH 2 GND
B GND
A REC RF
(Siehe Seite S 113, 114
See page S 113, 114)
HCHG C
N.C B
DOC P A'
PB RF OUT Z
RP 5V Y
RP GND X
RP PB MODE W
JOG V
ME/MP U
SP/LP T
RF SW P S
REC ATF RF R
REC Y RF Q
REC AFM RF P
REC C RF O
N.C F
SLOW GAIN E
VA PB MODE D'
R087
5.6k
SS-93P BOARD (1/3)
VIDED, AUDIO BLOCK
Q302
AMP
R304 22
R306 330
L302 220μH
Q070
CURRENT
LIMITER
Q080
SWITCH
Q090
SWITCH
Q081
SWITCH
Q0090
2SA1576
R116 2.2
R077 100k
R078 100k

- **Signal path**
  - ➡≫ : REC Y Signal
  - ➡ : REC CHROMA Signal
  - ➡≫≫ : REC Y/CHROMA Signal
  - ⇨≫≫ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

Signal path

Drum spe
Drum pha
Drum serv
Capstan se
Ref. signal

ITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) SCHEMATIC DIAGRAM

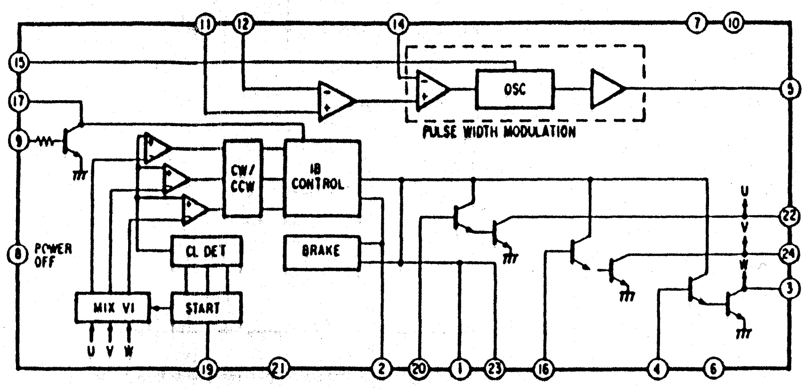
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28

- **Signal path**
  - ➡ : REC Y Signal
  - ➡ : REC CHROMA Signal
  - ➡ : REC Y/CHROMA Signal
  - ⇨ : PB Y/CHROMA Signal
  - ➡ : REC AUDIO Signal
  - ⇨ : PB AUDIO Signal

Signal path

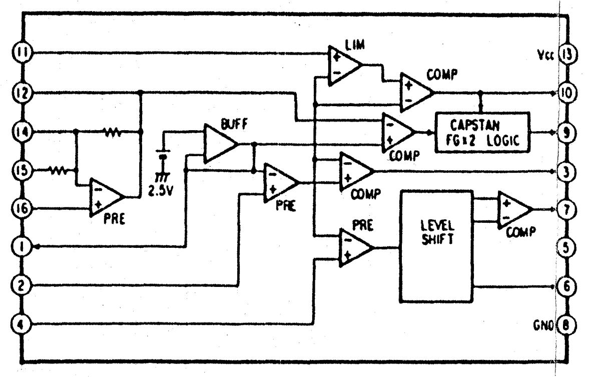
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan servo (speed and phase)		▷	
Ref. signal	➡	▷	▷

IC004 CX20114

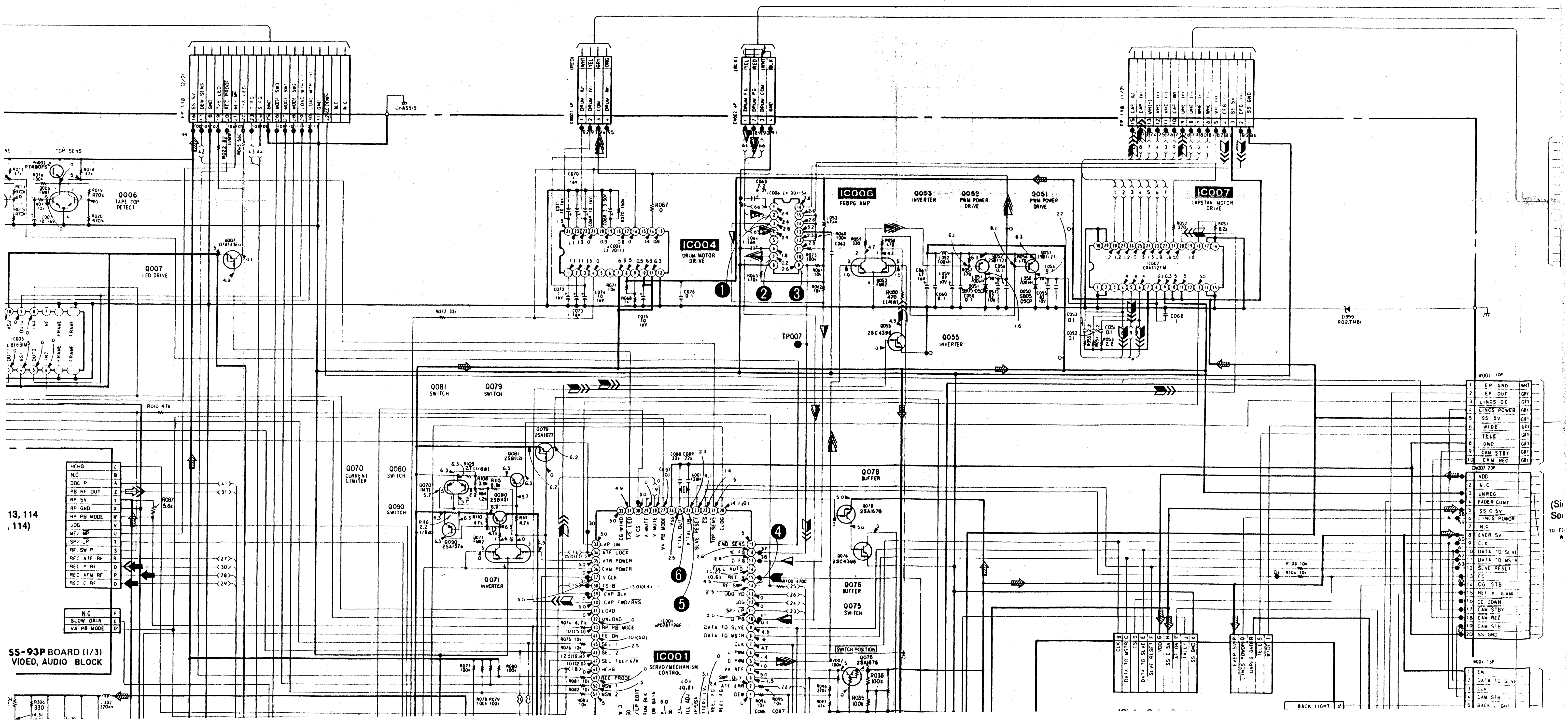


CW/CCW
IB CONTROL
PULSE WIDTH MODULATION
OSC
CL DET
BRAKE
MIX VI
START
POWER OFF
U V W

IC006 CX20115A



LIM
COMP
BUFF
CAPSTAN FG×2 LOGIC
PRE
2.5V
LEVEL SHIFT
Vcc
GND

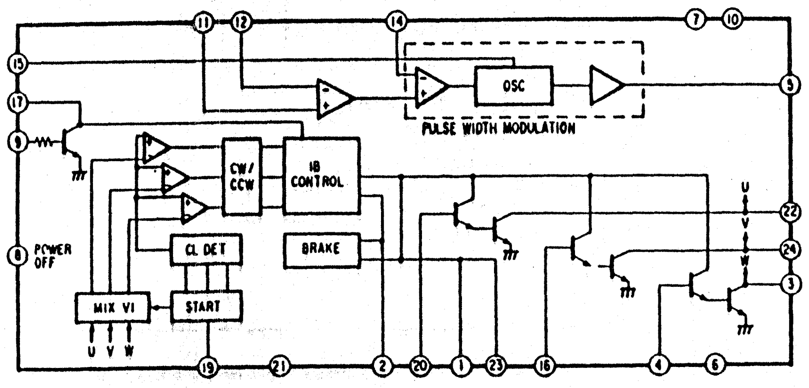


CHASSIS
Q006 TAPE TOP DETECT
Q007 LED DRIVE
IC004 DRUM MOTOR DRIVE
IC006 FGBPG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q051 PWM POWER DRIVE
IC007 CAPSTAN MOTOR DRIVE
Q055 INVERTER
TP007
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
IC001 SERVO/MECHANISM CONTROL
SWITCH POSITION
D399 RD2.7MB1
SS-93P BOARD (1/3) VIDEO, AUDIO BLOCK
13, 114
, 114)
CN001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
CN007 20P
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWOR
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V (LAMI)
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
BACK LIGHT
HCHG
N.C
DOC P
PB RF OUT
RP 5V
RP GND
RP PB MODE
JOG
SP/LP
RF SW P
REC ATF RF
REC Y RF
REC AFM RF
REC C RF
SLOW GAIN
VA PB MODE

19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34

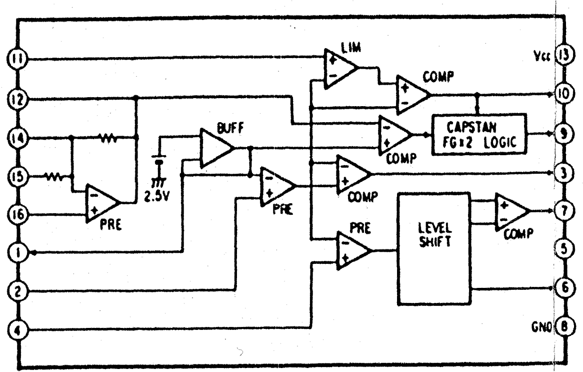
REC/PB	PB
▷	
▷	
▷	
▷	
▷	▷

IC004 CX20114



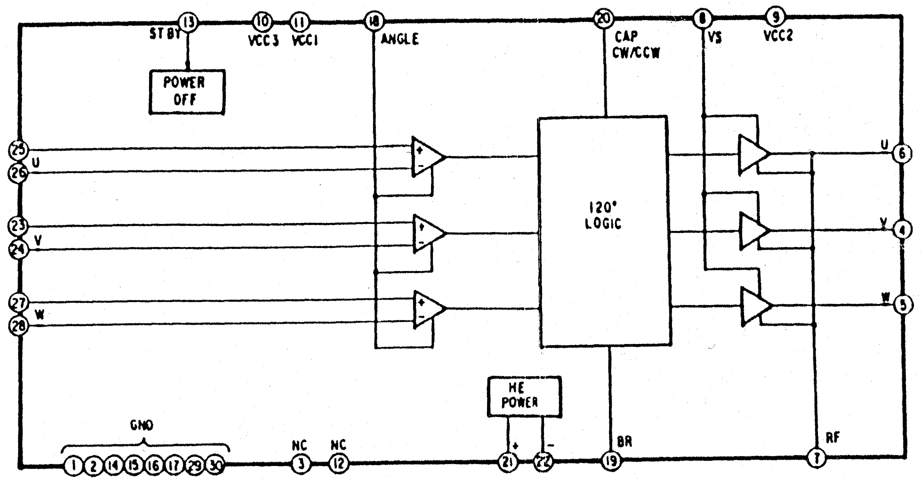
OSC
PULSE WIDTH MODULATION
CW/CCW
HB CONTROL
CL DET
BRAKE
START
MIX VI
POWER OFF
U V W

IC006 CX20115A

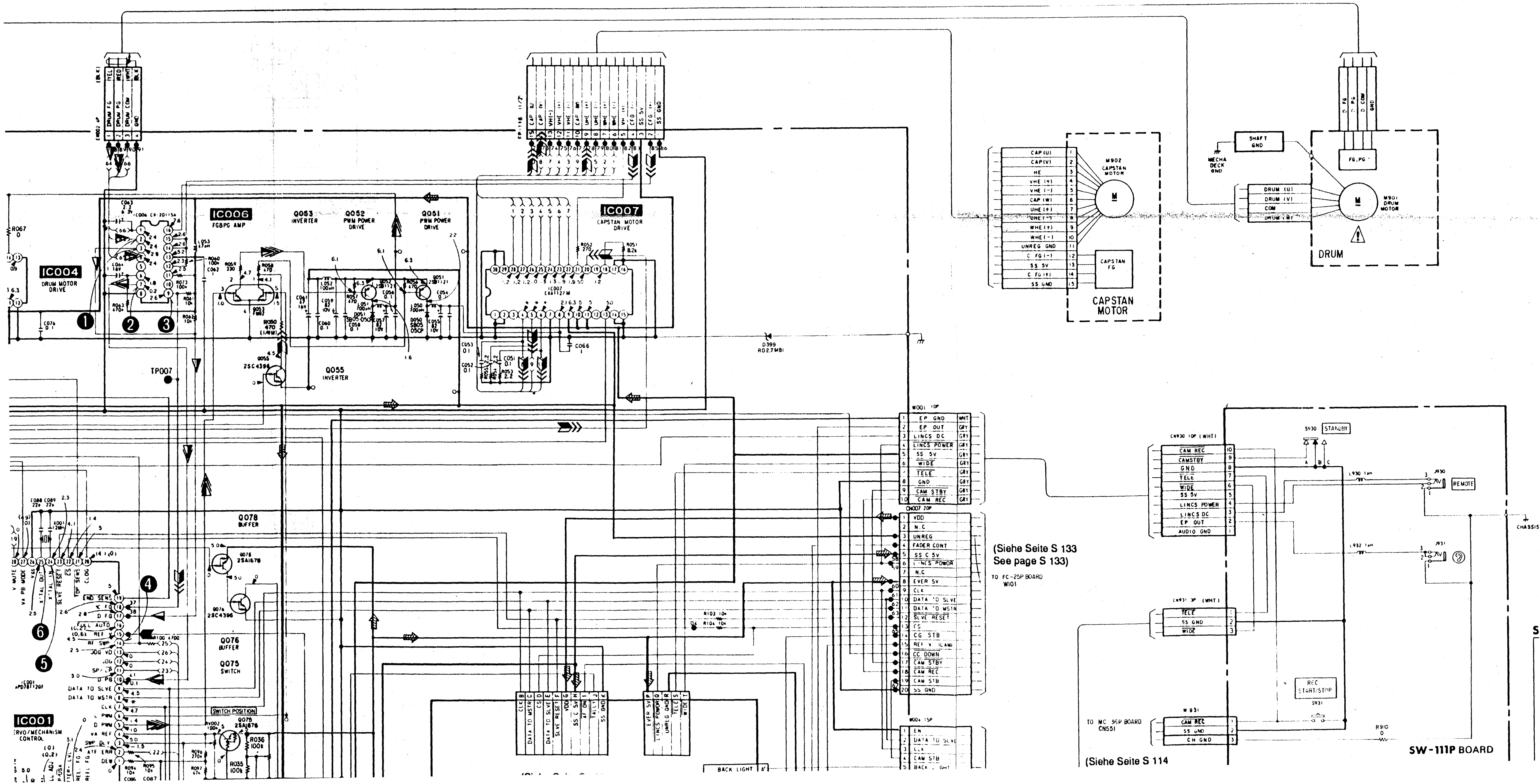


LIM
COMP
CAPSTAN FG×2 LOGIC
BUFF
PRE
2.5V
LEVEL SHIFT
Vcc
GND

IC007 CXA1127M

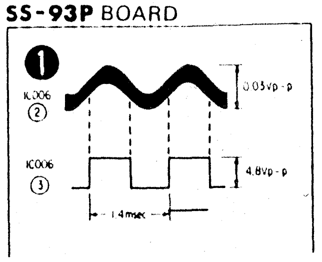


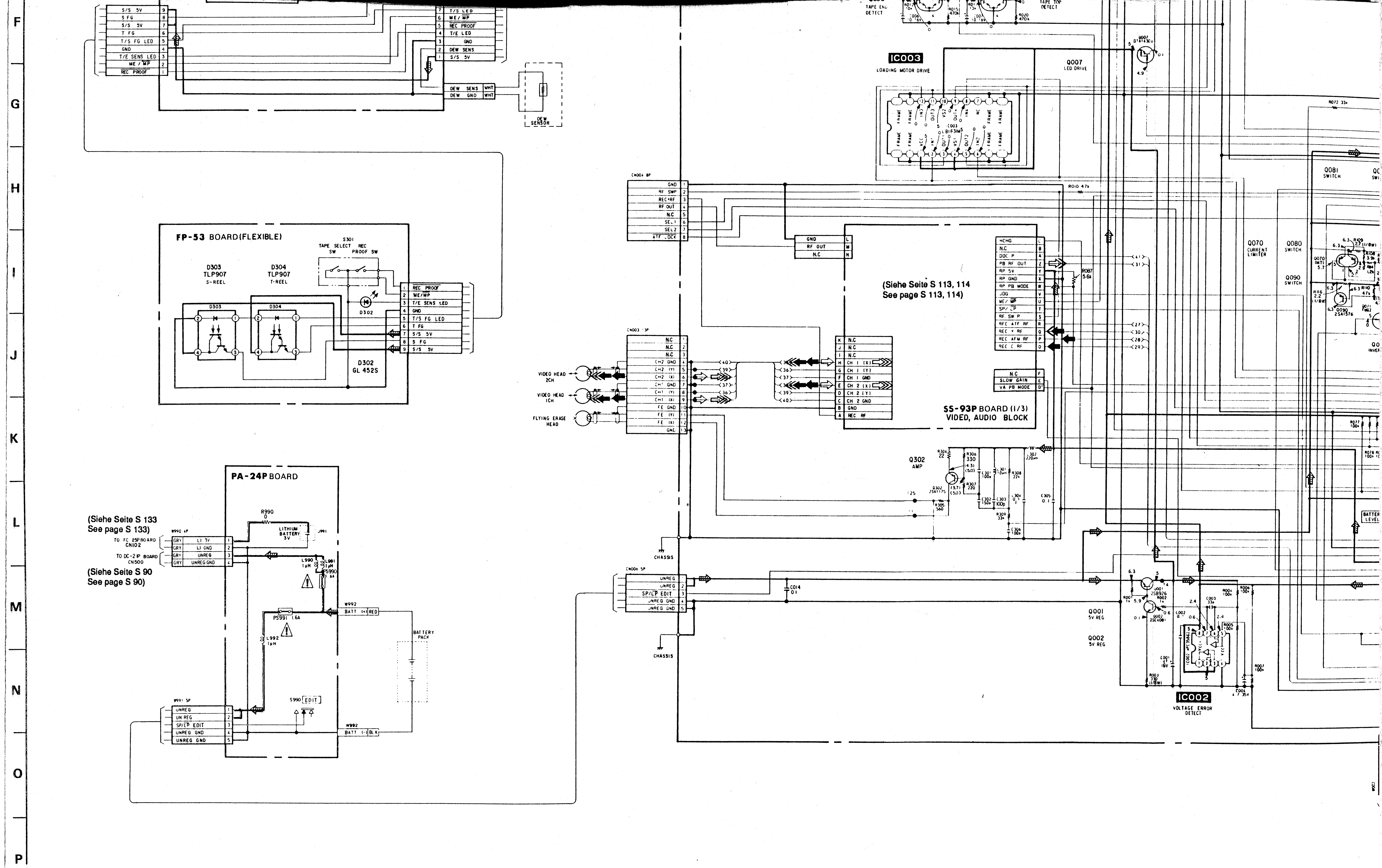
STBY
POWER OFF
VCC3
VCC1
ANGLE
CAP CW/CCW
VS
VCC2
120° LOGIC
U
V
W
HE POWER
GND
NC
BR
RF

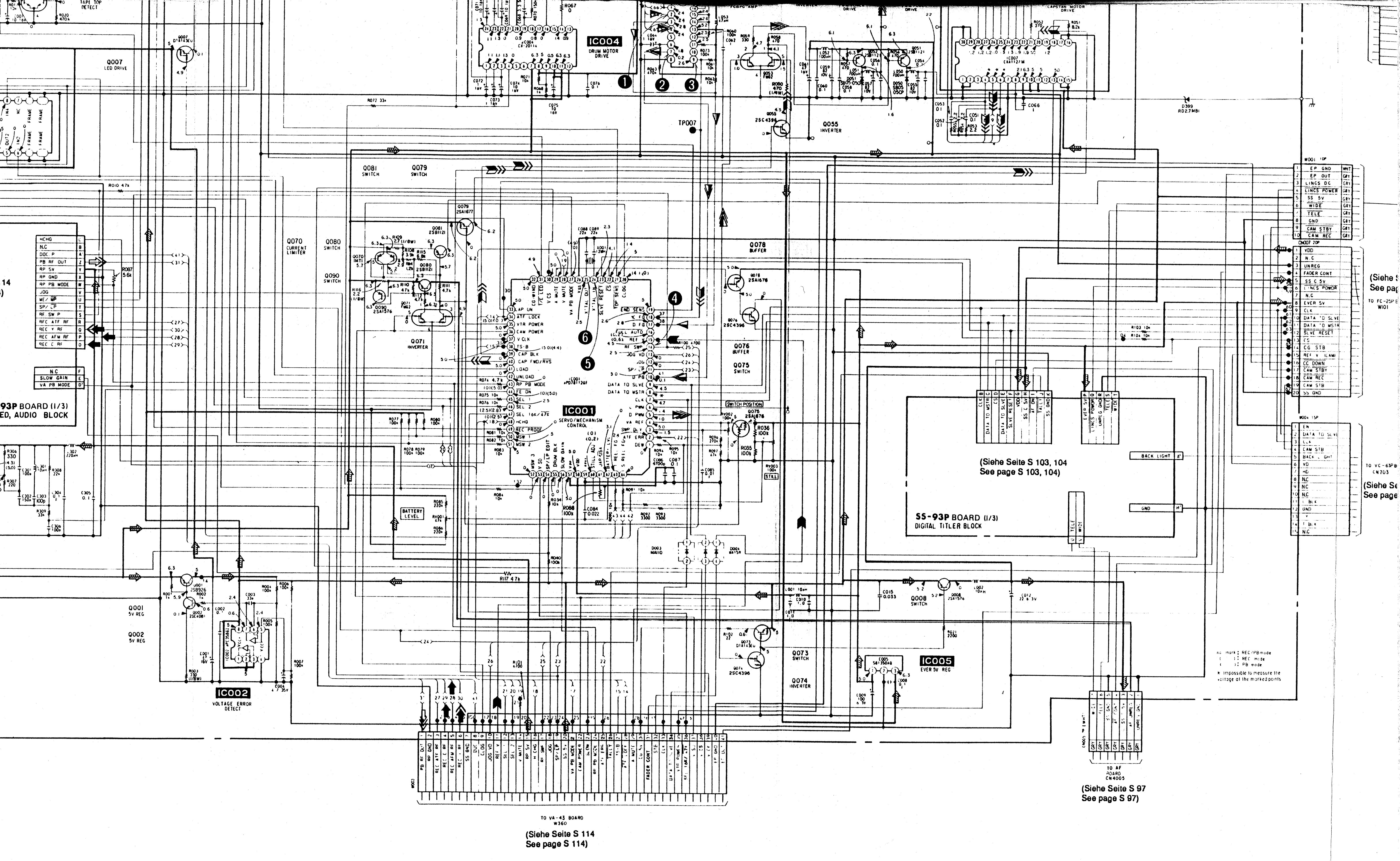


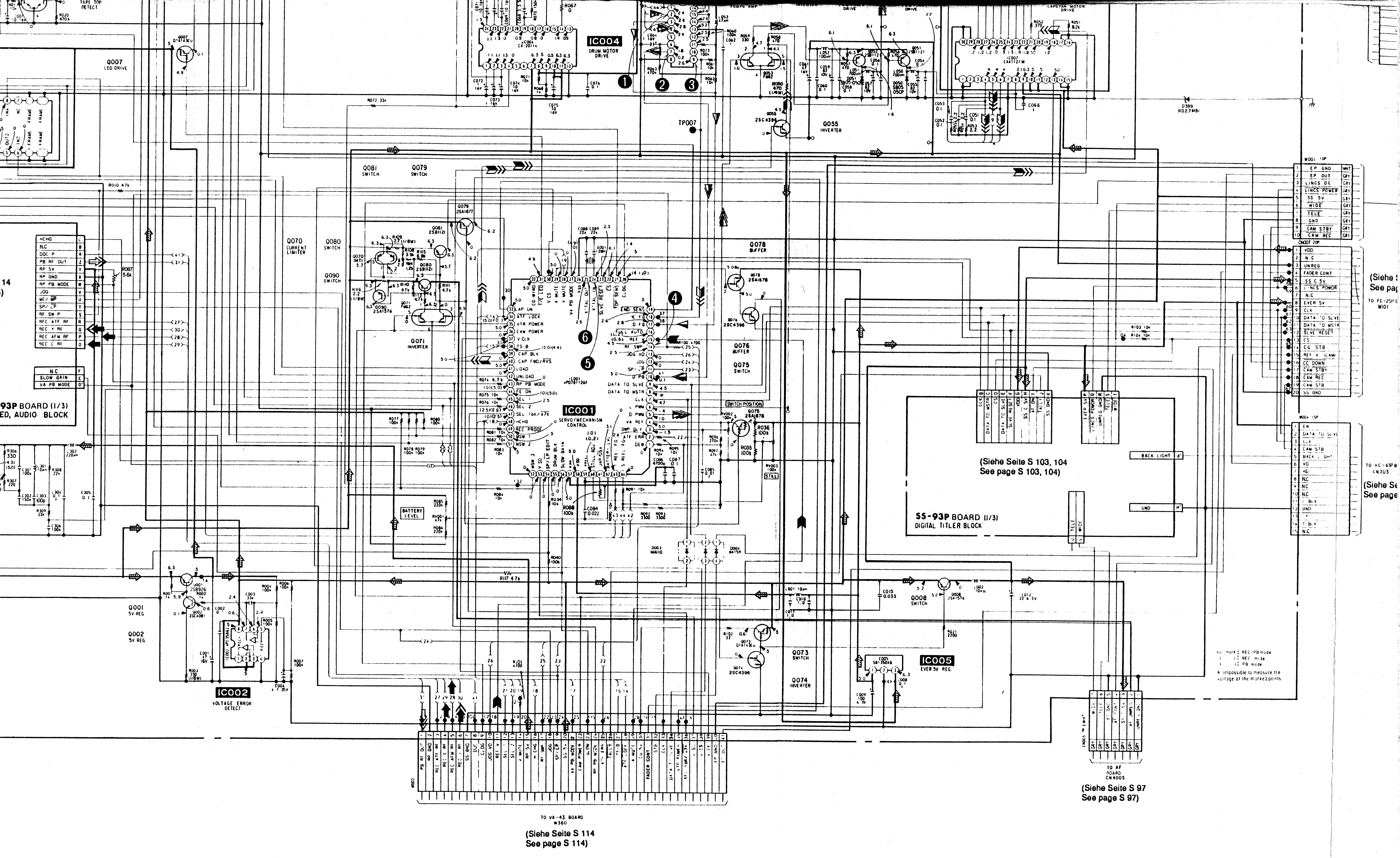
IC004
DRUM MOTOR DRIVE
IC006
FGBPG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q051 PWM POWER DRIVE
IC007
CAPSTAN MOTOR DRIVE
Q055 INVERTER
TP007
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
SWITCH POSITION
IC001
SERVO/MECHANISM CONTROL
D399 RD2.7MB1
CAP(U)
CAP(V)
HE
VHE(+)
VHE(-)
CAP(W)
UHE(+)
UHE(-)
WHE(+)
WHE(-)
UNREG GND
C FG(-)
SS 5V
C FG(+)
SS GND
M902
CAPSTAN MOTOR
CAPSTAN FG
CAPSTAN MOTOR
SHAFT GND
MECHA DECK GND
DRUM (U)
DRUM (V)
COM
FG,PG
M901
DRUM MOTOR
DRUM
W001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
CN007 20P
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REC V-SLAMI
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
(Siehe Seite S 133
See page S 133)
TO FC-25P BOARD W101
(Siehe Seite S 114
CN930 10P (WHT)
CAM REC
CAMSTBY
GND
TELE
WIDE
SS 5V
LINCS POWER
LINCS DC
EP OUT
AUDIO GND
S930 STANDBY
J930
REMOTE
J931
CHASSIS
CN931 3P (WHT)
TELE
SS GND
WIDE
TO MC-35P BOARD CN551
W931
CAM REC
SS GND
CH GND
REC START/STOP
S931
R910 0
SW-111P BOARD
BACK LIGHT
END SENS
DATA TO SLVE
DATA TO MSTR

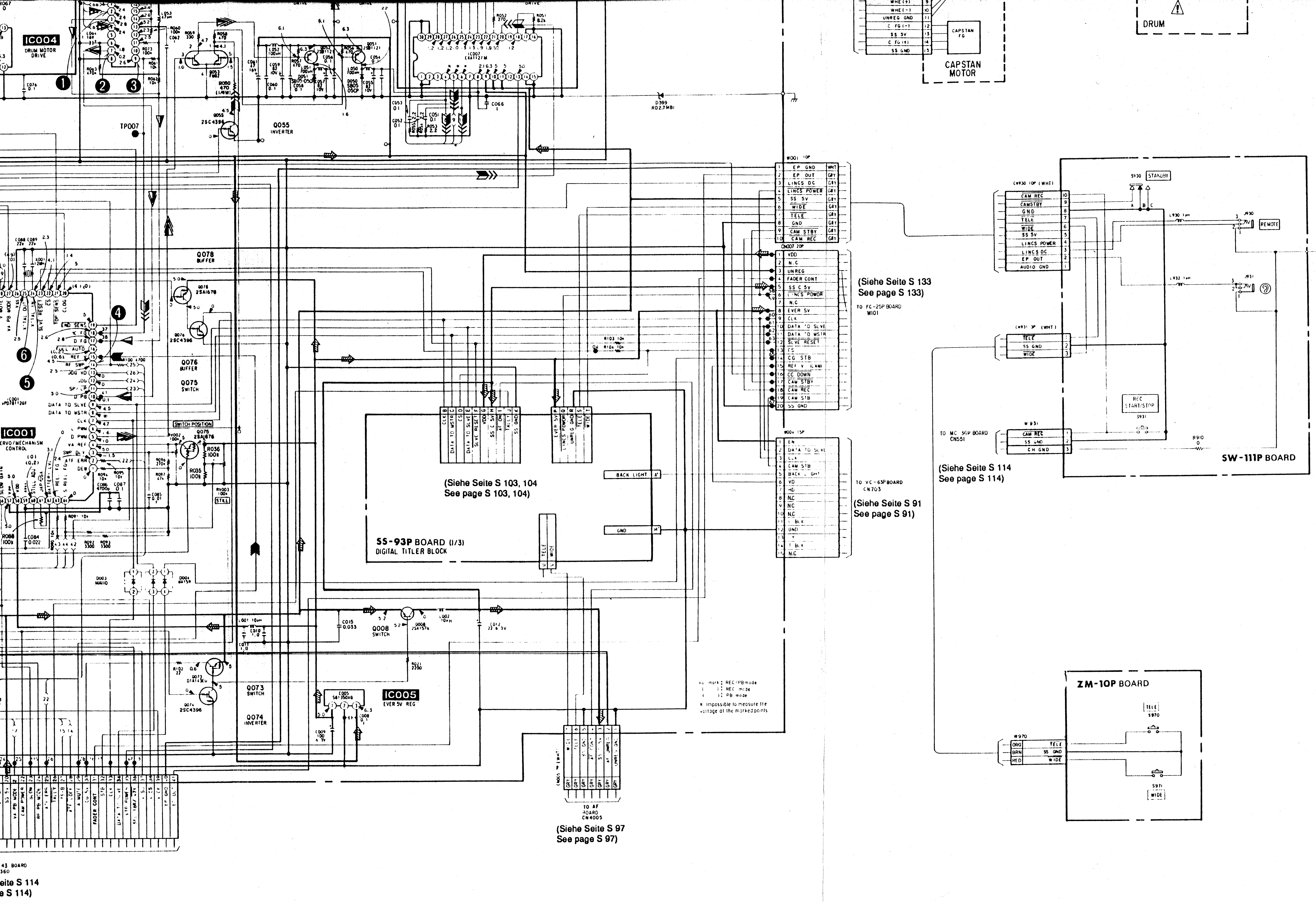
SS-93P BOARD



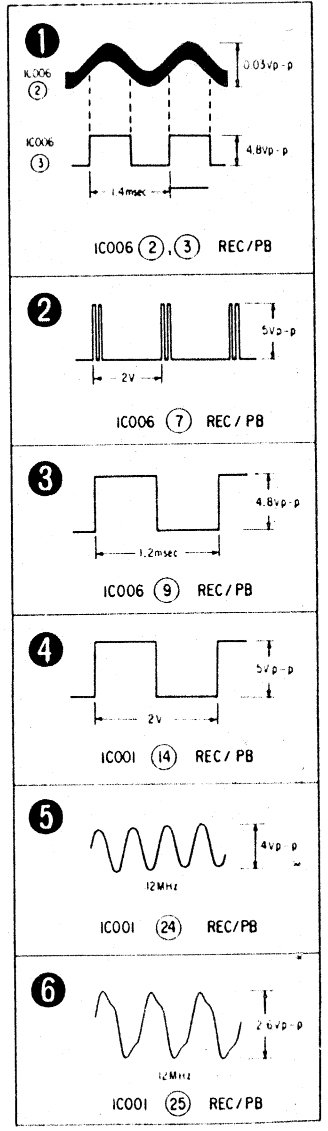

F
G
H
I
J
K
L
M
N
O
P
S/S 5V
S FG
S/S 5V
T FG
T/S FG LED
GND
T/E SENS LED
ME / MP
REC PROOF
T/S LED
ME/MP
REC PROOF
T/E LED
GND
DEW SENS
S/S 5V
DEW SENS
DEW GND
WHT
DEW SENSOR
FP-53 BOARD (FLEXIBLE)
S301
TAPE SELECT SW
REC PROOF SW
D303
TLP907
S-REEL
D304
TLP907
T-REEL
D302
GL 452S
REC PROOF
ME/MP
T/E SENS LED
GND
T/S FG LED
T FG
S/S 5V
S FG
S/S 5V
PA-24P BOARD
(Siehe Seite S 133
See page S 133)
W990 4P
TO FC 25P BOARD CN102
TO DC-21P BOARD CN500
(Siehe Seite S 90
See page S 90)
GRY
LI 3V
LI GND
UNREG
UNREG GND
R990
0
LITHIUM BATTERY 3V
J991
L990 1µH
L991 1µH
PS990 1.6A
PS991 1.6A
L992 1µH
W992
BATT (+)
RED
BATT (-)
BLK
BATTERY PACK
S990 EDIT
W991 5P
UNREG
UN REG
SP/LP EDIT
UNREG GND
UNREG GND
VIDEO HEAD 2CH
VIDEO HEAD 1CH
FLYING ERASE HEAD
CN004 8P
GND
RF SWP
REC•RF
RF OUT
N.C
SEL 1
SEL 2
ATF LOCK
CN003 13P
N.C
CH2 GND
CH2 (Y)
CH2 (X)
CH1 GND
CH1 (Y)
CH1 (X)
FE GND
FE (Y)
FE (X)
GND
CHASSIS
CN006 5P
UNREG
SP/LP EDIT
UNREG GND
C014
0.1
(Siehe Seite S 113, 114
See page S 113, 114)
SS-93P BOARD (1/3)
VIDEO, AUDIO BLOCK
GND
RF OUT
N.C
CH 1 (X)
CH 1 (Y)
CH 1 GND
CH 2 (X)
CH 2 (Y)
CH 2 GND
REC RF
HCHG
DOC P
PB RF OUT
RP 5V
RP GND
RP PB MODE
JOG
ME/MP
SP/LP
RF SW P
REC ATF RF
REC Y RF
REC AFM RF
REC C RF
SLOW GAIN
VA PB MODE
Q302
AMP
Q302
2SA1175
R304 22
R306 330
R307 220
R305 560
R308 22k
R309 33k
L301 10µH
L302 220µH
C301 100p
C302 150p
C303 100p
C304 0.1
C305 0.1
C306 100p
TAPE END DETECT
TAPE TOP DETECT
R012 10k
R015 470k
R017 10k
R020 470k
C006 10 16V
C007 10 16V
IC003
LOADING MOTOR DRIVE
IC003
LB1631M
FRAME
IN3
OUT3
VS2
OUT4
IN4
NC
VCC
IN1
OUT1
VS1
OUT2
IN2
Q007
LED DRIVE
Q007
DTA143EU
R010 47k
R087 5.6k
R072 33k
Q081
SWITCH
Q070
CURRENT LIMITER
Q080
SWITCH
Q090
SWITCH
Q070
IMT1
R109 2.7 (1/8W)
R108 3.9k
R114 1.2k
R116 2.2 (1/8W)
R110 47k
Q090
2SA1576
Q071
FMG2
INVERTER
R077 100k
R078 100k
BATTERY LEVEL
Q001
5V REG
Q002
5V REG
Q001
2SB926
Q002
2SC4081
R001 1k
R002 1k
R003 330 (1/8W)
R004 100k
R005 100k
R006 100k
R007 100k
C001 47 16V
C002 0.1
C003 33p
C004 4.7 35V
IC002
µPC358G2
IC002
VOLTAGE ERROR DETECT


IC001
SERVO/MECHANISM CONTROL
IC002
VOLTAGE ERROR DETECT
IC004
DRUM MOTOR DRIVE
IC005
EVER 5V REG
Q007 LED DRIVE
Q001 5V REG
Q002 5V REG
Q055 INVERTER
Q070 CURRENT LIMITER
Q071 INVERTER
Q073 SWITCH
Q074 INVERTER
Q075 SWITCH
Q076 BUFFER
Q078 BUFFER
Q079 SWITCH
Q080 SWITCH
Q081 SWITCH
Q090 SWITCH
Q008 SWITCH
TP007
BATTERY LEVEL
SWITCH POSITION
STILL
CAPSTAN MOTOR DRIVE
TAPE TOP DETECT
93P BOARD (1/3)
ED, AUDIO BLOCK
SS-93P BOARD (1/3)
DIGITAL TITLER BLOCK
BACK LIGHT
GND
TO VA-43 BOARD W360
(Siehe Seite S 114
See page S 114)
TO AF BOARD CN4005
(Siehe Seite S 97
See page S 97)
(Siehe Seite S 103, 104
See page S 103, 104)
TO VC-65P8 CN703
TO FC-25P E W101
(Siehe S
See pag
(Siehe Se
See page
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
* : Impossible to measure the voltage at the marked points
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWOR
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V ILLAMI
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
HCHG
DOC P
PB RF OUT
RP 5V
RP GND
RP PB MODE
JOG
ME/MP
SP/LP
RF SW P
REC ATF RF
REC Y RF
REC AFM RF
REC C RF
SLOW GAIN
VA PB MODE
AP ON
ATF LOCK
VTR POWER
CAM POWER
V CLK
TS-B
CAP BLK
CAP FWD/RVS
LOAD
UNLOAD
RP PB MODE
FE ON
SEL 1
SEL 2
SEL 16K/47E
HCHG
REC PROOF
MSW 1
MSW 2
MSW 3
END SENS
DATA TO SLVE
DATA TO MSTR
D PWM
VA REF
SWP DLY
ATF ERR
DEW
STILL ADJ
BATTERY LVL
CG WIND
VCS
A MUTE
VA PB MODE
X'TAL OUT
X'TAL IN
SLVE RESET
CS
CLOG
D003 MA110
D004 MA159
D399 RD2.7MB1
1
2
3
4
5
6


IC004
DRUM MOTOR DRIVE
IC001
SERVO/MECHANISM CONTROL
IC002
VOLTAGE ERROR DETECT
IC005
EVER 5V REG
Q007 LED DRIVE
Q055 INVERTER
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q081 SWITCH
Q079 SWITCH
Q071 INVERTER
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
Q001 5V REG
Q002 5V REG
Q008 SWITCH
Q073 SWITCH
Q074 INVERTER
TP007
SWITCH POSITION
BATTERY LEVEL
STILL
93P BOARD (1/3)
ED, AUDIO BLOCK
SS-93P BOARD (1/3)
DIGITAL TITLER BLOCK
(Siehe Seite S 103, 104
See page S 103, 104)
TO VA-43 BOARD
W360
(Siehe Seite S 114
See page S 114)
TO AF BOARD
CN4005
(Siehe Seite S 97
See page S 97)
TO FC-25P E
W101
TO VC-65P B
CN703
(Siehe S
See pag
(Siehe Se
See page
W001 10P
CN007 20P
W004 15P
W003
BACK LIGHT
GND
TELE
WIDE
1
2
3
4
5
6
no mark : REC/PB mode
( ) : REC mode
⟨ ⟩ : PB mode
※ : Impossible to measure the voltage at the marked points


IC004
DRUM MOTOR DRIVE
IC007
Q055 INVERTER
TP007
D399 RD2.7MB1
CAPSTAN FG
CAPSTAN MOTOR
DRUM
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
IC001
SERVO/MECHANISM CONTROL
SWITCH POSITION
STILL
W001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
CN007 20P
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V (LAM)
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
(Siehe Seite S 133
See page S 133)
TO FC-25P BOARD W101
W004 15P
(Siehe Seite S 91
See page S 91)
TO VC-63P BOARD CN703
SS-93P BOARD (1/3)
DIGITAL TITLER BLOCK
(Siehe Seite S 103, 104
See page S 103, 104)
BACK LIGHT
GND
Q008 SWITCH
IC005
EVER 5V REG
Q073 SWITCH
Q074 INVERTER
TO AF BOARD CN4005
(Siehe Seite S 97
See page S 97)
eite S 114
e S 114)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
✱ : impossible to measure the voltage at the marked points
CN930 10P (WHT)
CAM REC
CAMSTBY
GND
TELE
WIDE
SS 5V
LINCS POWER
LINCS DC
EP OUT
AUDIO GND
S930 STANDBY
J930 REMOTE
J931
CHASSIS
CN931 3P (WHT)
TELE
SS GND
WIDE
REC START/STOP S931
W931
CAM REC
SS GND
CH GND
TO MC-36P BOARD CN551
(Siehe Seite S 114
See page S 114)
SW-111P BOARD
ZM-10P BOARD
TELE S970
S971 WIDE
W970
ORG
BRN
RED

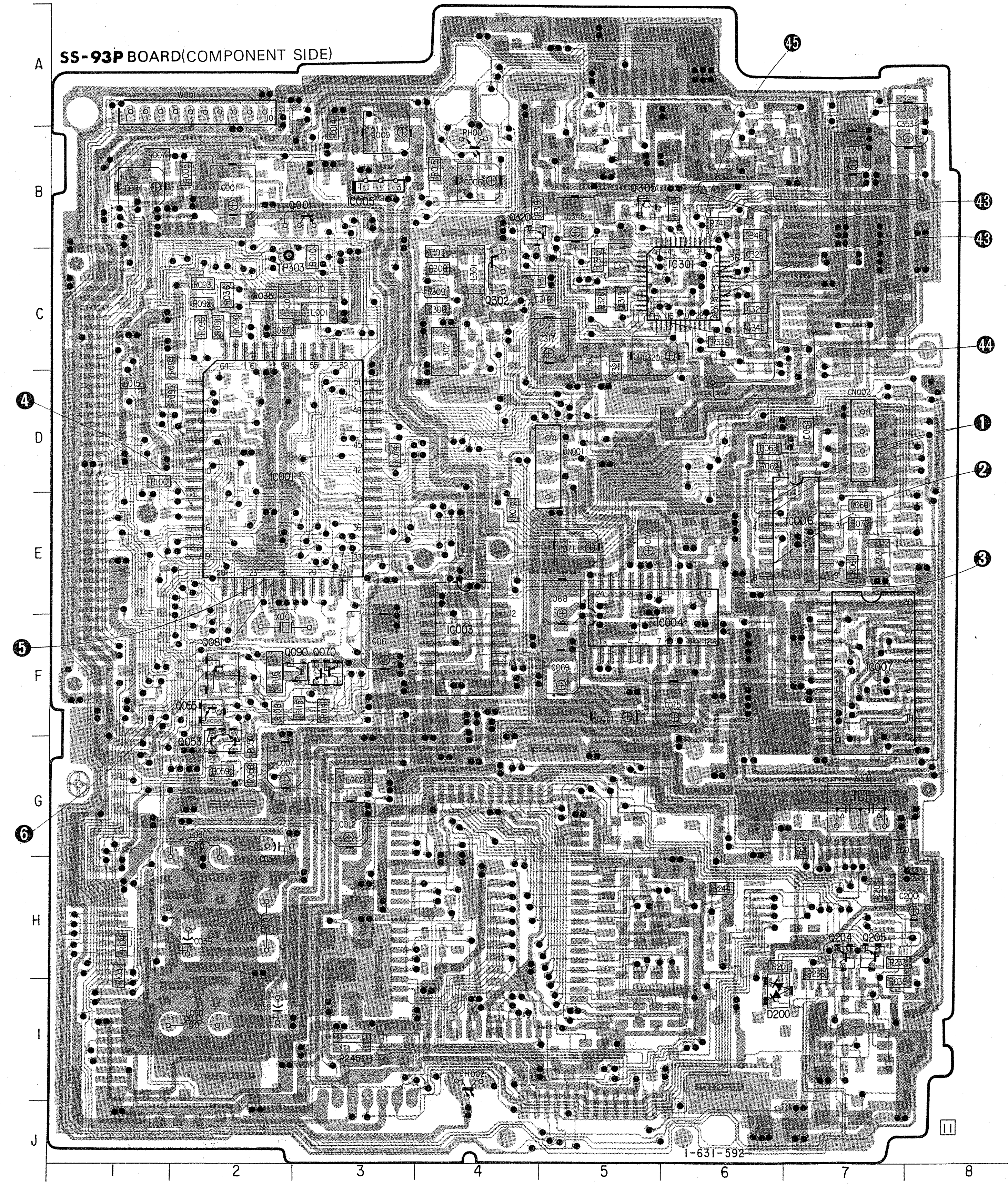
SS-93P BOARD

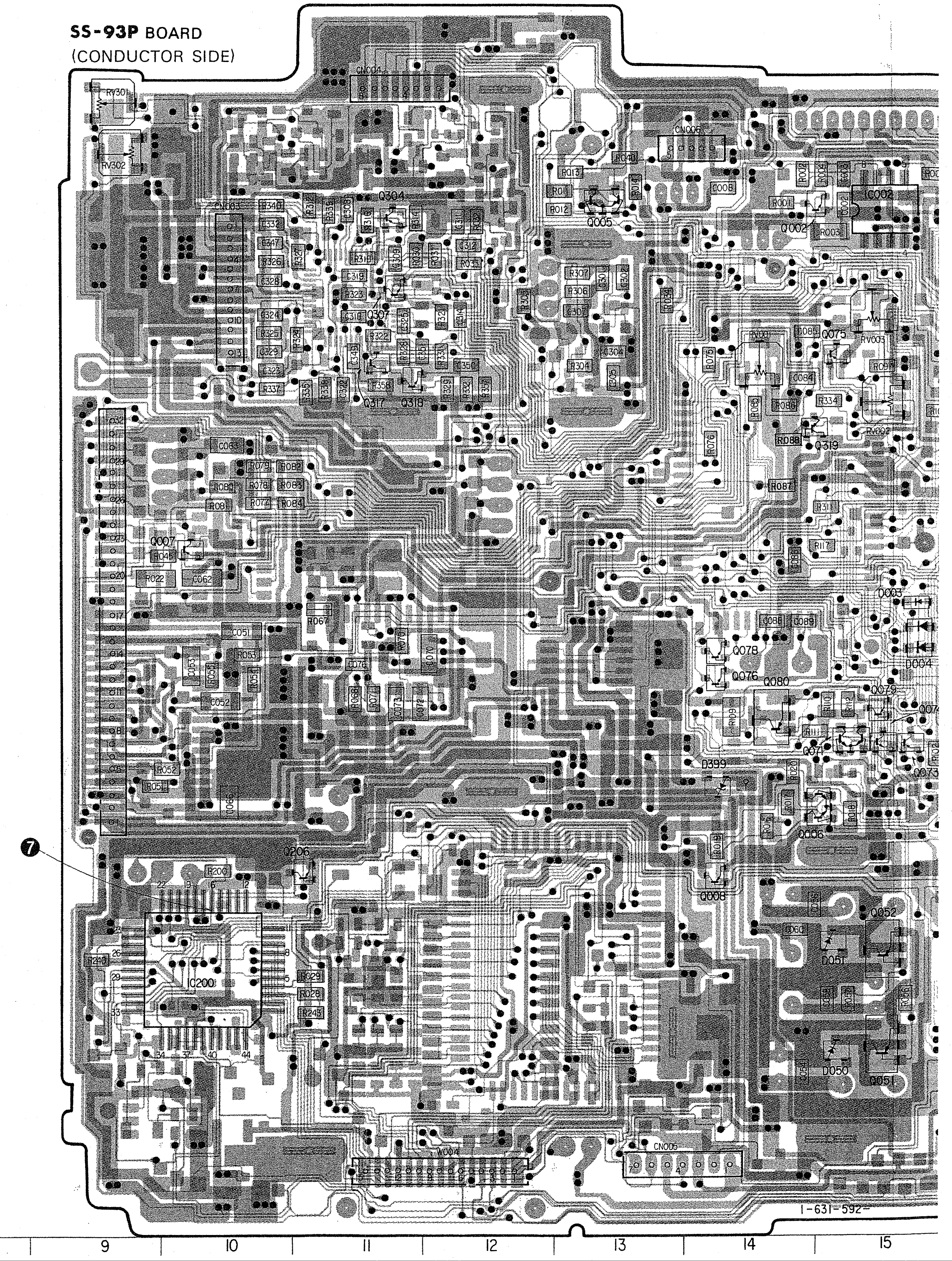

❶
0.05Vp-p
4.8Vp-p
1.4msec
IC006 ②,③ REC/PB
❷
5Vp-p
2V
IC006 ⑦ REC/PB
❸
4.8Vp-p
1.2msec
IC006 ⑨ REC/PB
❹
5Vp-p
2V
IC001 ⑭ REC/PB
❺
4Vp-p
12MHz
IC001 ㉔ REC/PB
❻
2.6Vp-p
12MHz
IC001 ㉕ REC/PB

SS-93P (SERVO/SYSTEM CONTROL), SW-111P (START/STOP SWITCH, STANDBY SWITCH, IN/OUT JACK), ZM-10P (ZOOM SWITCH), PA-24P (POWER), CC-7 (MODE SWITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) PRINTED WIRING BOAR

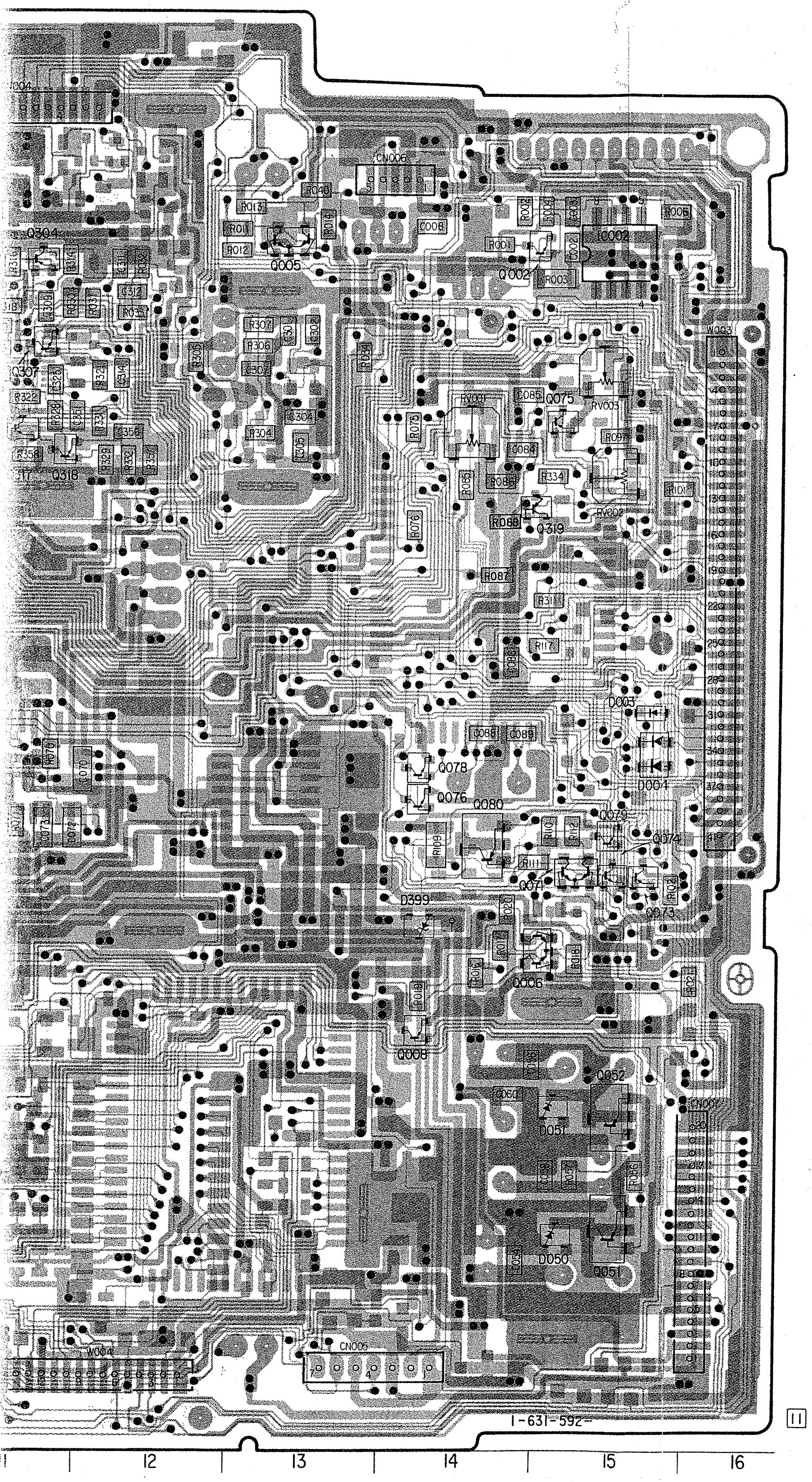
—Ref. No. SS-93P BOARD ; 2,000 series, SW-111P, ZM-10P, PA-24P, CC-7, FP-53 BOARDS ; 3,000 series—

D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q204	H-7
Q205	H-7
Q206	G-11
Q302	C-4
Q304	B-11
Q305	B-5
Q307	C-11
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4

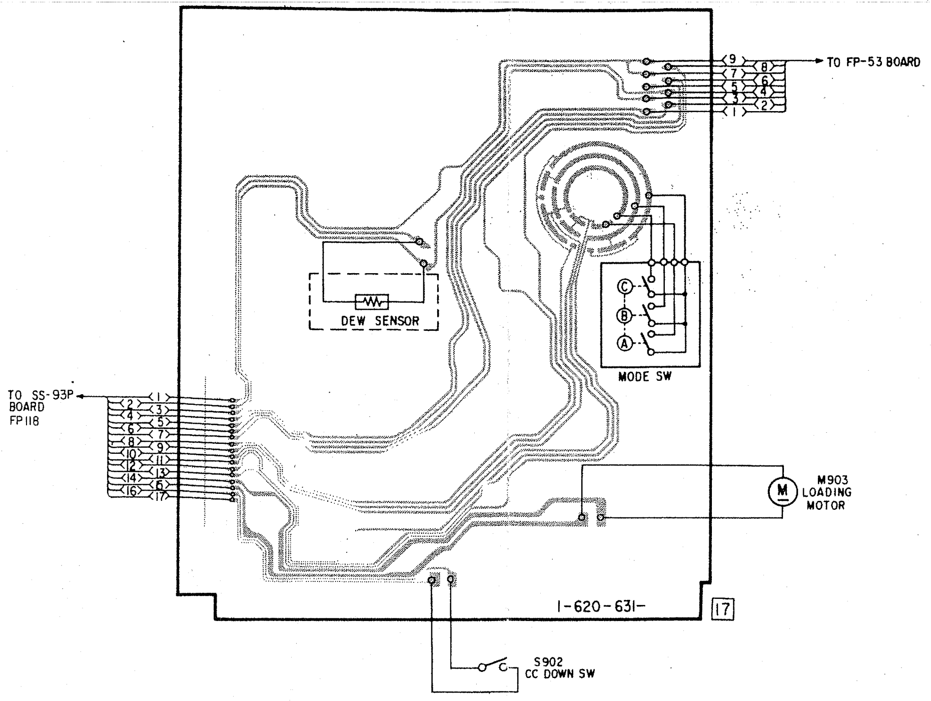

SS-93P BOARD(COMPONENT SIDE)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
45
43
43
44
4
1
2
3
5
6
IC001
IC003
IC004
IC006
IC007
IC301
IC005
Q001
Q302
Q305
Q320
Q204
Q205
D200
1-631-592-
11


SS-93P BOARD
(CONDUCTOR SIDE)
9
10
11
12
13
14
15
7
IC002
IC200
Q002
Q005
Q007
Q008
Q006
Q206
Q304
Q307
Q317
Q318
Q319
Q075
Q076
Q078
Q080
Q051
Q052
D050
D051
D004
1-631-592-

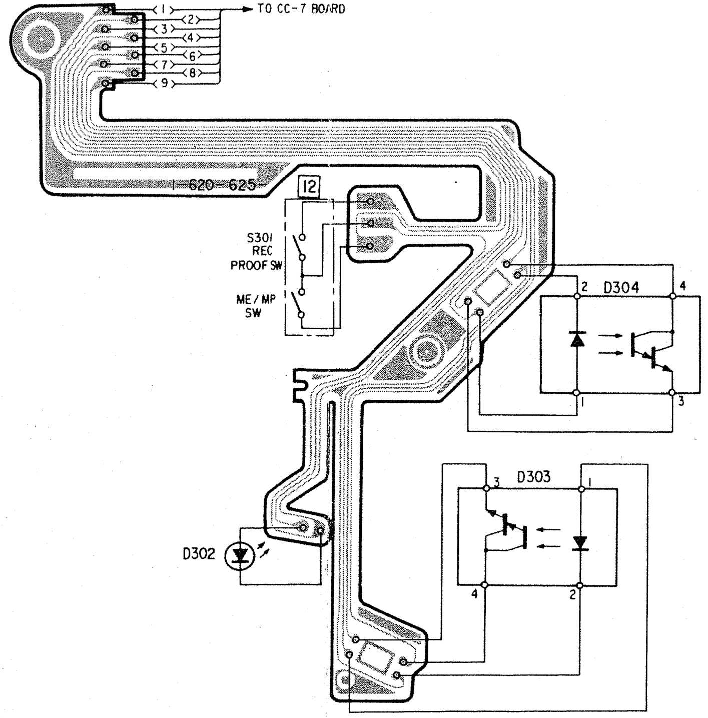
FP-53 (TAPE SELECT/CASSETTE IN SWITCH) PRINTED WIRING BOARDS


CN006
R013
R011
R012
Q005
C008
R001
Q002
R003
IC002
R006
Q304
Q307
R322
R358
R117
Q318
R307
R306
R304
RV001
C085
Q075
RV003
R084
R334
R088
Q319
R087
R311
Q003
D004
Q078
Q076
Q080
Q079
Q074
D399
Q071
Q073
Q006
Q008
Q052
Q051
D051
D050
CN005
W004
W003
1-631-592-
11
12
13
14
15
16

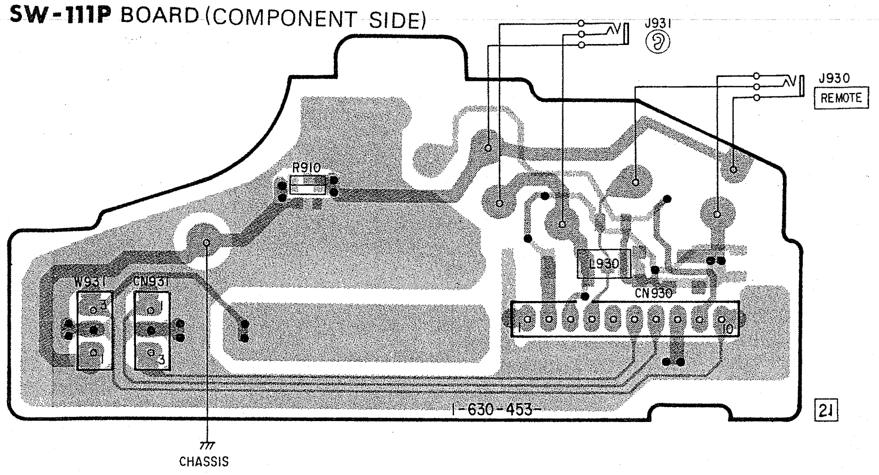
CC-7 BOARD


TO FP-53 BOARD
TO SS-93P BOARD FP118
DEW SENSOR
MODE SW
A
B
C
M903 LOADING MOTOR
M
S902 CC DOWN SW
1-620-631-
17

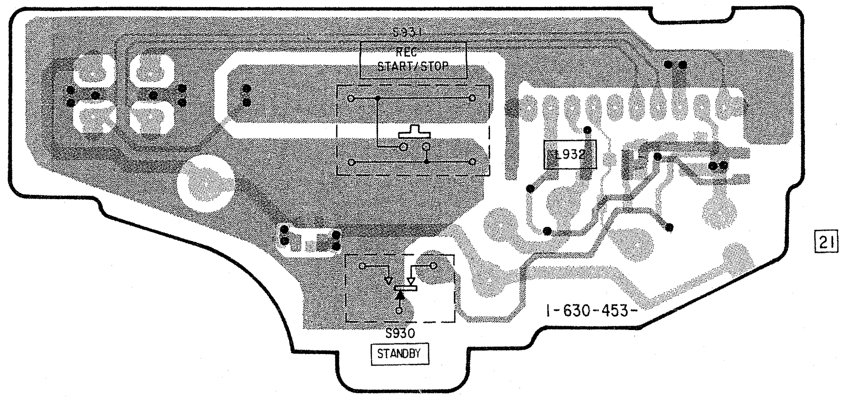
FP-53 BOARD (FLEXIBLE)


TO CC-7 BOARD
1-620-625-
12
S301 REC PROOF SW
ME/MP SW
D304
D303
D302

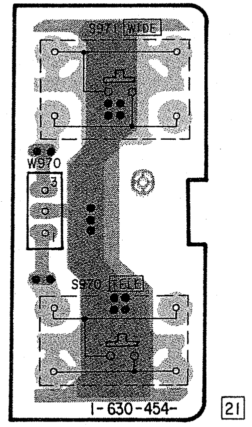
SW-111P BOARD (COMPONENT SIDE)


J931
J930
REMOTE
R910
W931
CN931
L930
CN930
CHASSIS
1-630-453-
21

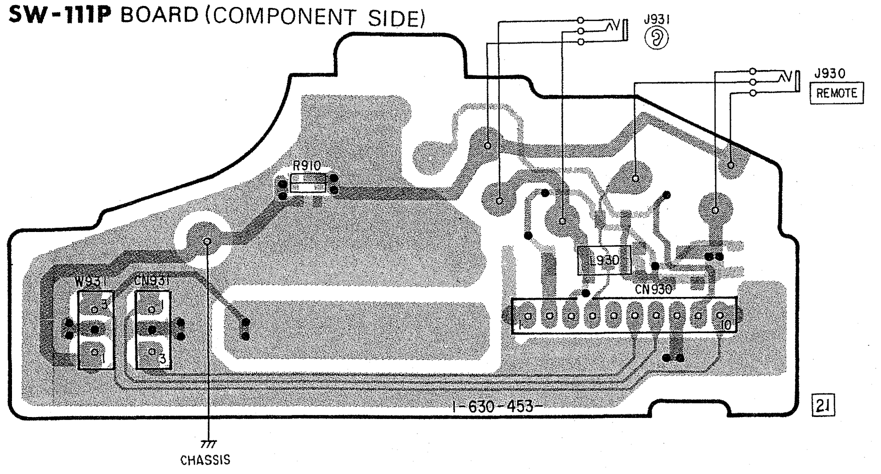
SW-111P BOARD (CONDUCTOR SIDE)


S931 REC START/STOP
L932
S930
STANDBY
1-630-453-
21

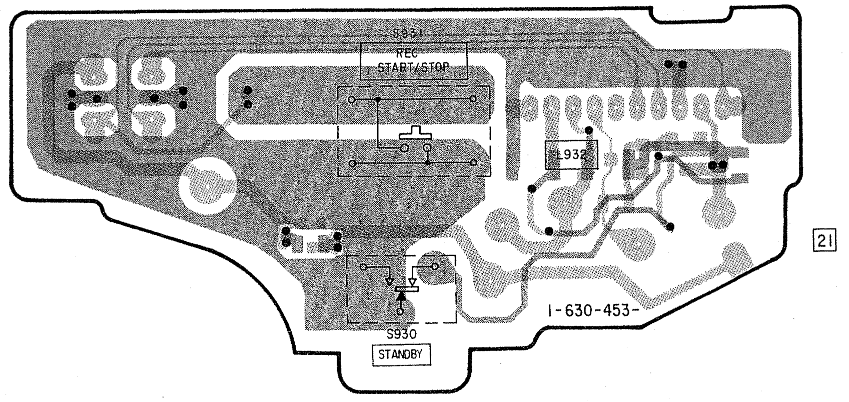
ZM-10P BOARD


S971 WIDE
W970
S970 TELE
1-630-454-
21

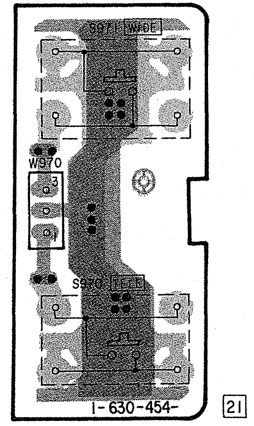
SW-111P BOARD (COMPONENT SIDE)


J931
J930
REMOTE
R910
L930
CN930
W93
CN931
1
3
10
1-630-453-
21
CHASSIS

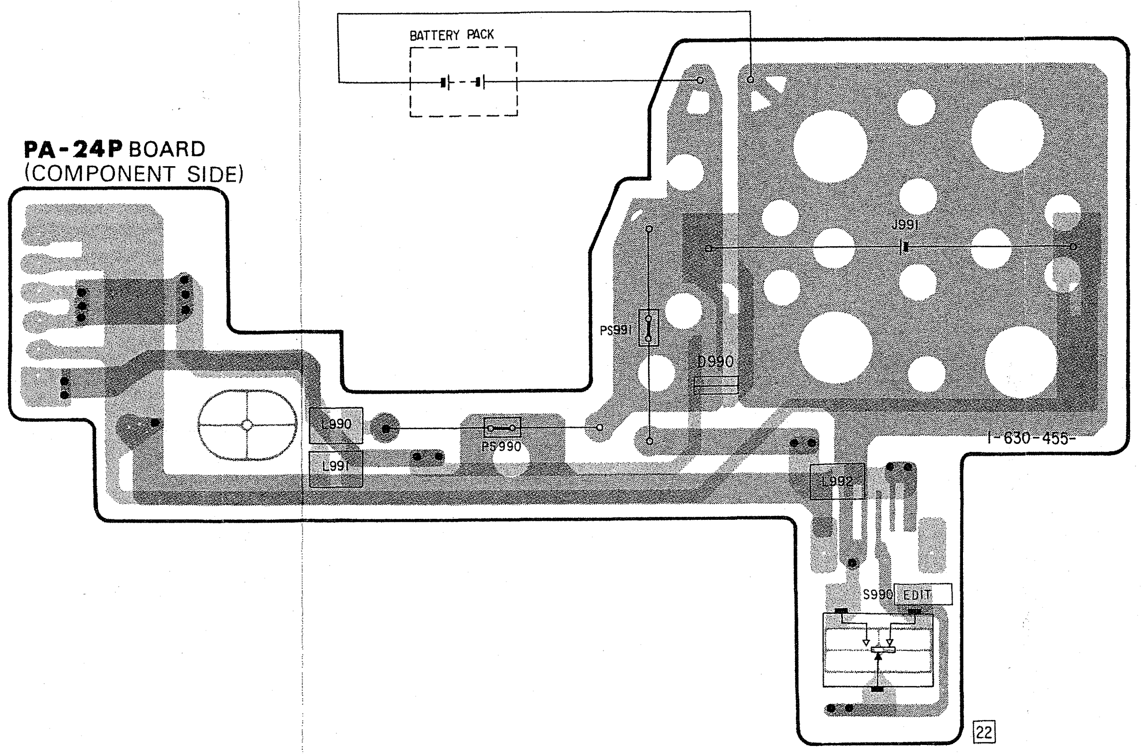
SW-111P BOARD (CONDUCTOR SIDE)


S931
REC
START/STOP
L932
S930
STANDBY
1-630-453-
21

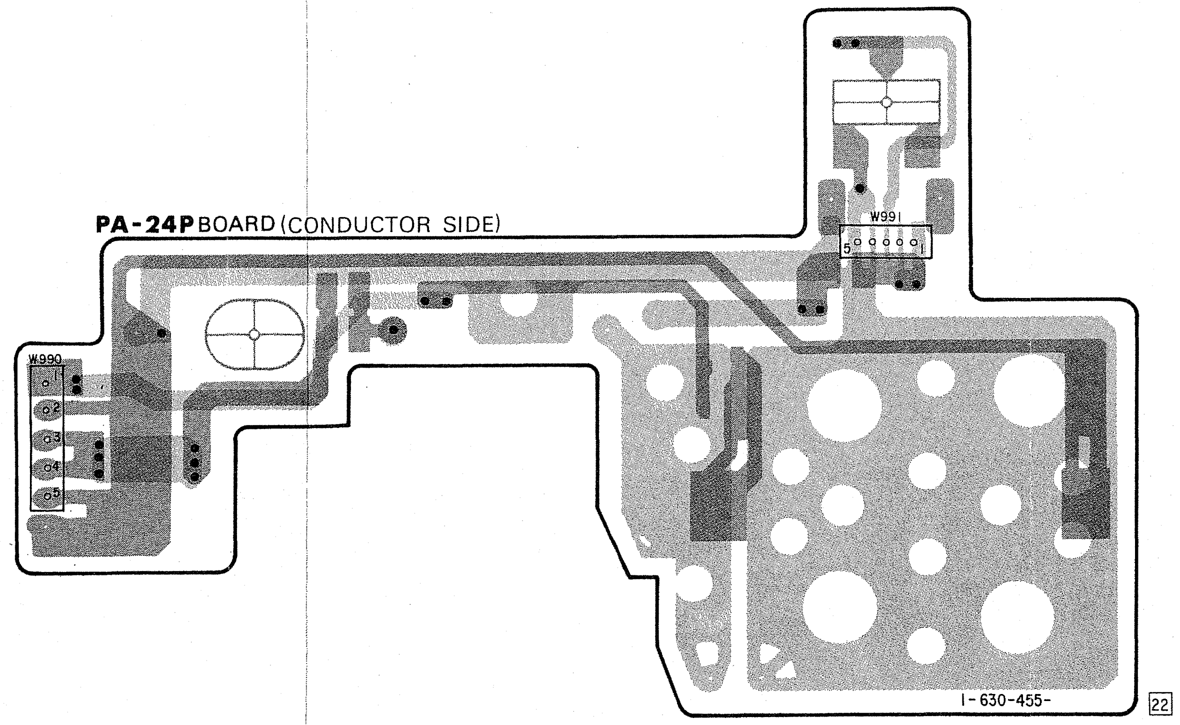
ZM-10P BOARD


S97
WIDE
W970
S970
TELE
1-630-454-
21

PA-24P BOARD (COMPONENT SIDE)


BATTERY PACK
J991
PS991
D990
L990
L991
PS990
L992
S990
EDIT
1-630-455-
22

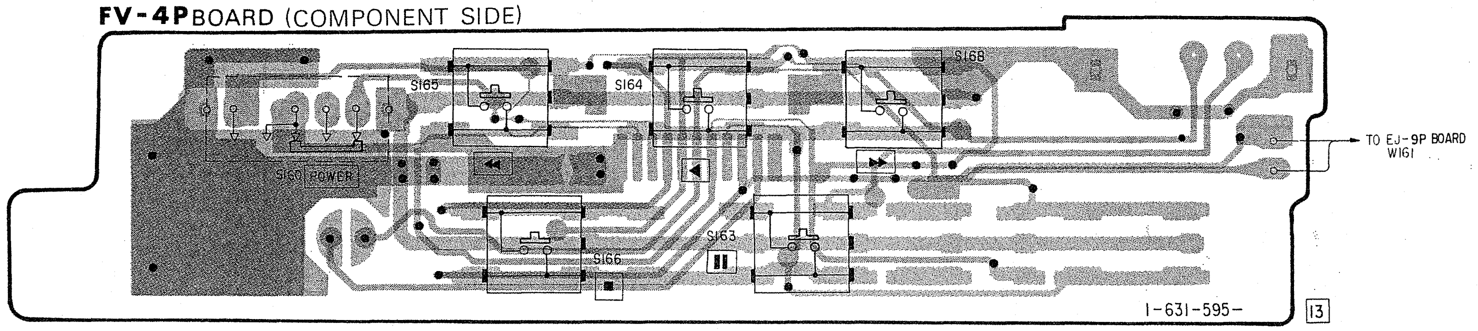
PA-24P BOARD (CONDUCTOR SIDE)


W991
5
W990
1
2
3
4
5
1-630-455-
22

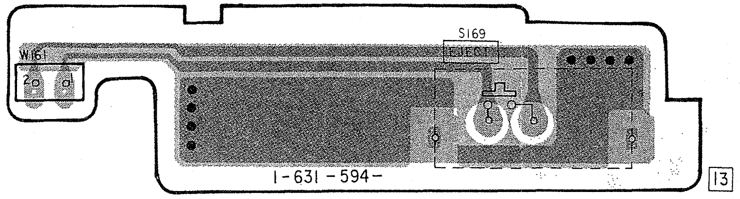
FC-25P (MODE CONTROL), FV-4P (POWER SWITCH, VTR FUNCTION SWITCH), FD-12P (CAMERA DATA FUNCTION SWITCH), EJ-9P (EJECT SWITCH) PRINTED WIRING BOARDS

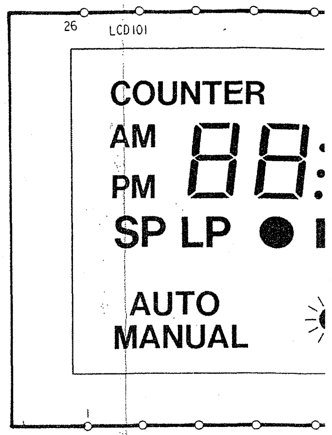
—Ref. No. FC-25P, FV-4P, FD-12P, EJ-9P BOARDS ; 4,000 series—

FV-4P BOARD (COMPONENT SIDE)

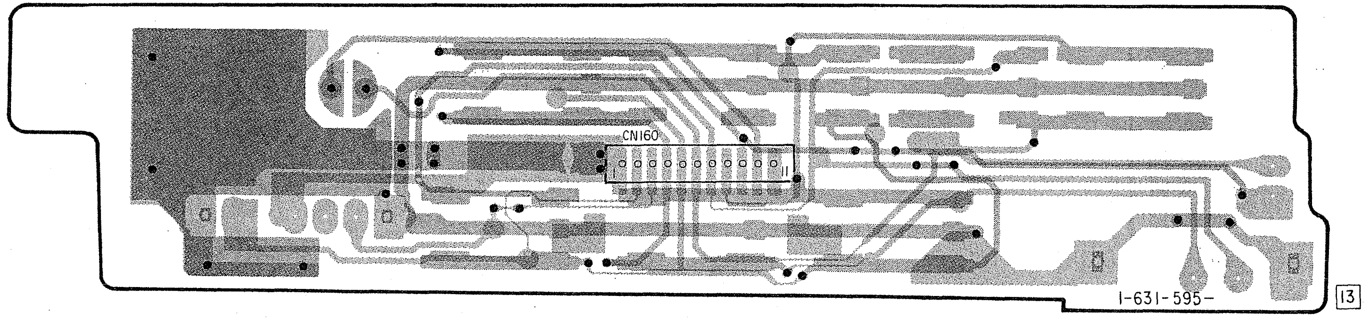

S165
S164
S168
S160 POWER
S163
S166
TO EJ-9P BOARD W161
1-631-595-
13

EJ-9P BOARD (COMPONENT SIDE)


W161
S169
EJECT
1-631-594-
13

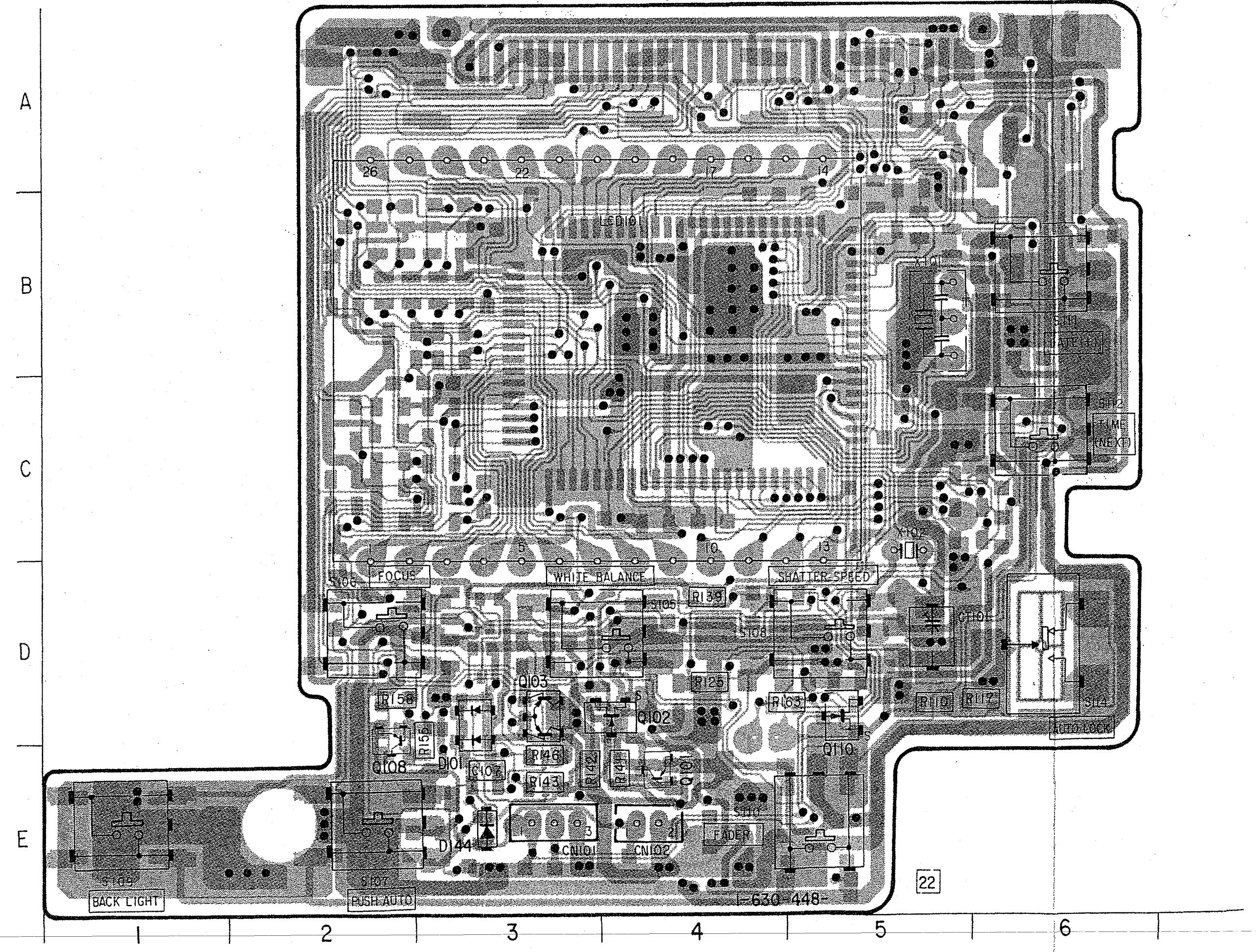

26
LCD101
COUNTER
AM
PM
SP LP
AUTO
MANUAL

FV-4P BOARD (CONDUCTOR SIDE)

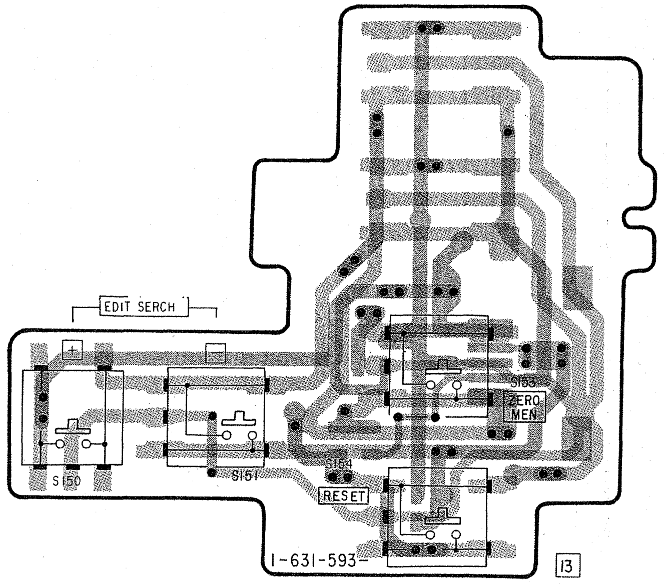

CN160
1-631-595-
13

FC-25P BOARD (COMPONENT SIDE)

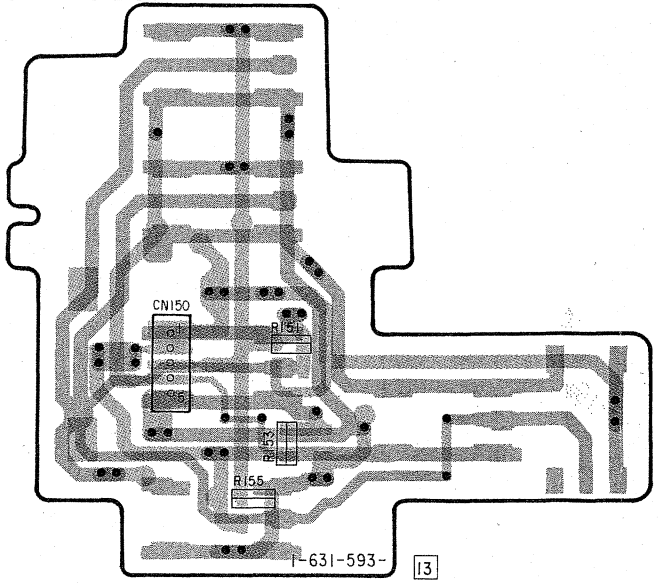
D101	D-3
D103	C-8
D104	E-11
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5


A
B
C
D
E
1
2
3
4
5
6
26
22
17
14
IC101
FOCUS
WHITE BALANCE
SHATTER SPEED
TIME (NEXT)
AUTO LOCK
BACK LIGHT
PUSH AUTO
FADER
CN101
CN102
Q101
Q102
Q103
Q108
Q110
S105
S107
1-630-448-
22

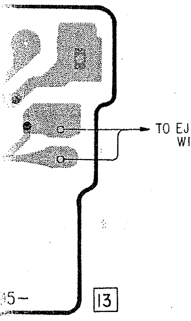
FD-12P BOARD (COMPONENT SIDE)

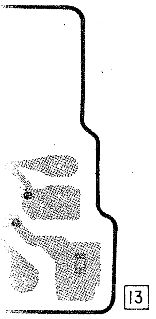

EDIT SERCH
S150
S151
S153
ZERO MEM
S154
RESET
1-631-593-
13

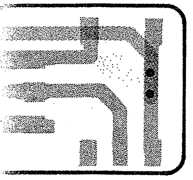
FD-12P BOARD (CONDUCTOR SIDE)


CN150
R156
R153
R155
1-631-593-
13

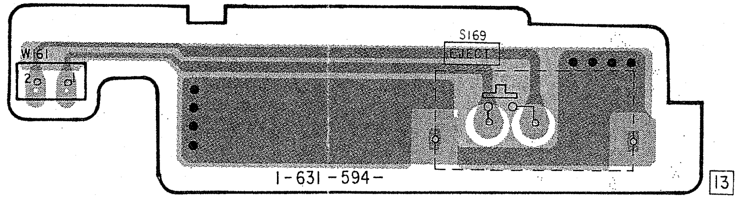
CTION SWITCH), EJ-9P (EJECT SWITCH) PRINTED WIRING BOARDS

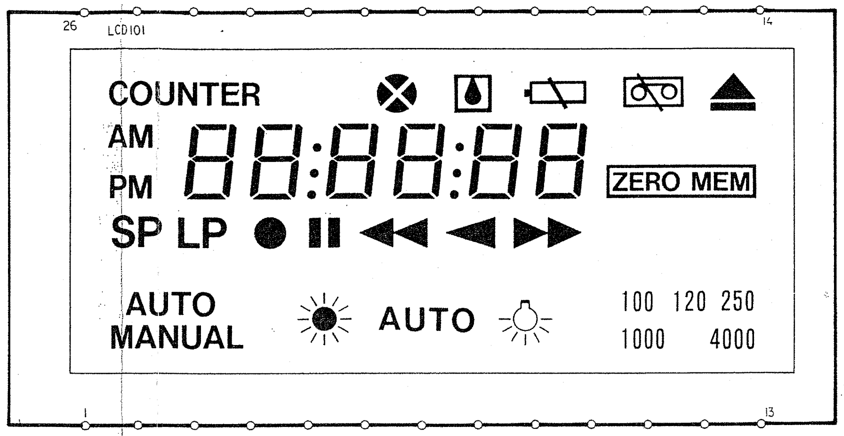

TO EJ-9P BOARD
W161
5-
13





EJ-9P BOARD (COMPONENT SIDE)

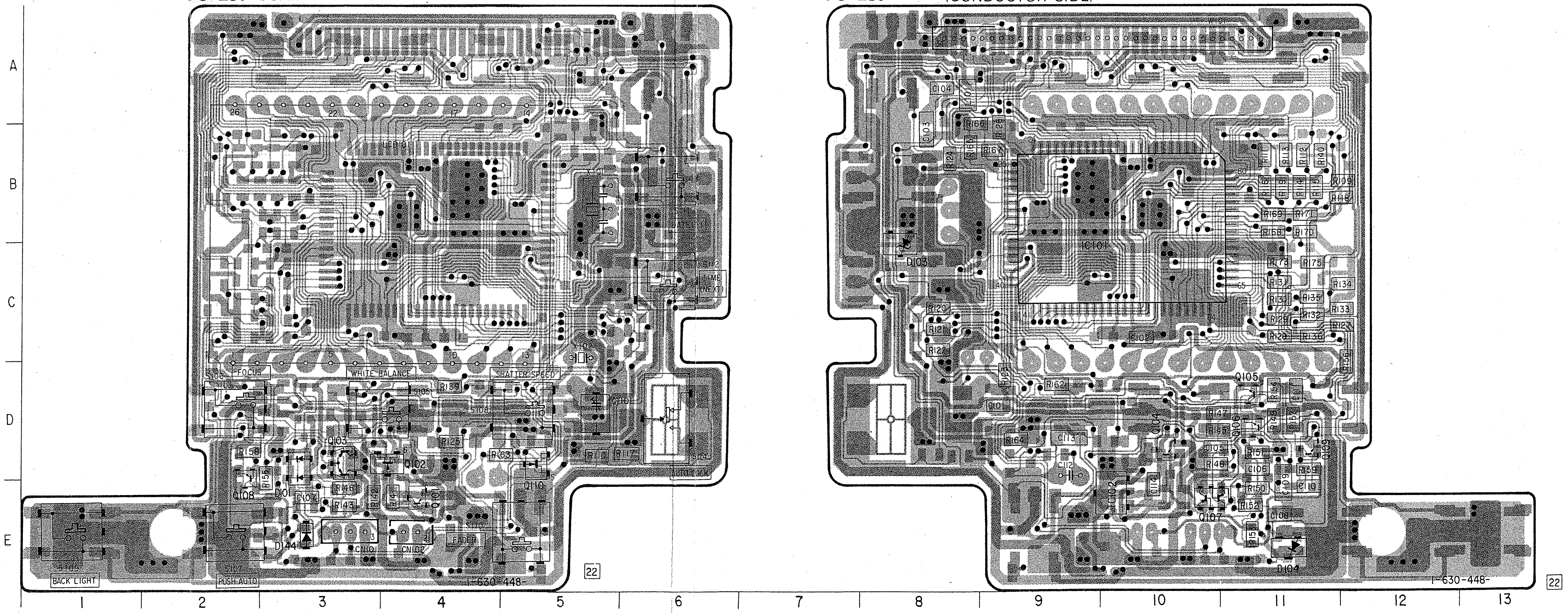

W161
S169
EJECT
1-631-594-
13


26
LCD101
14
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
1
13

FC-25P BOARD(COMPONENT SIDE)

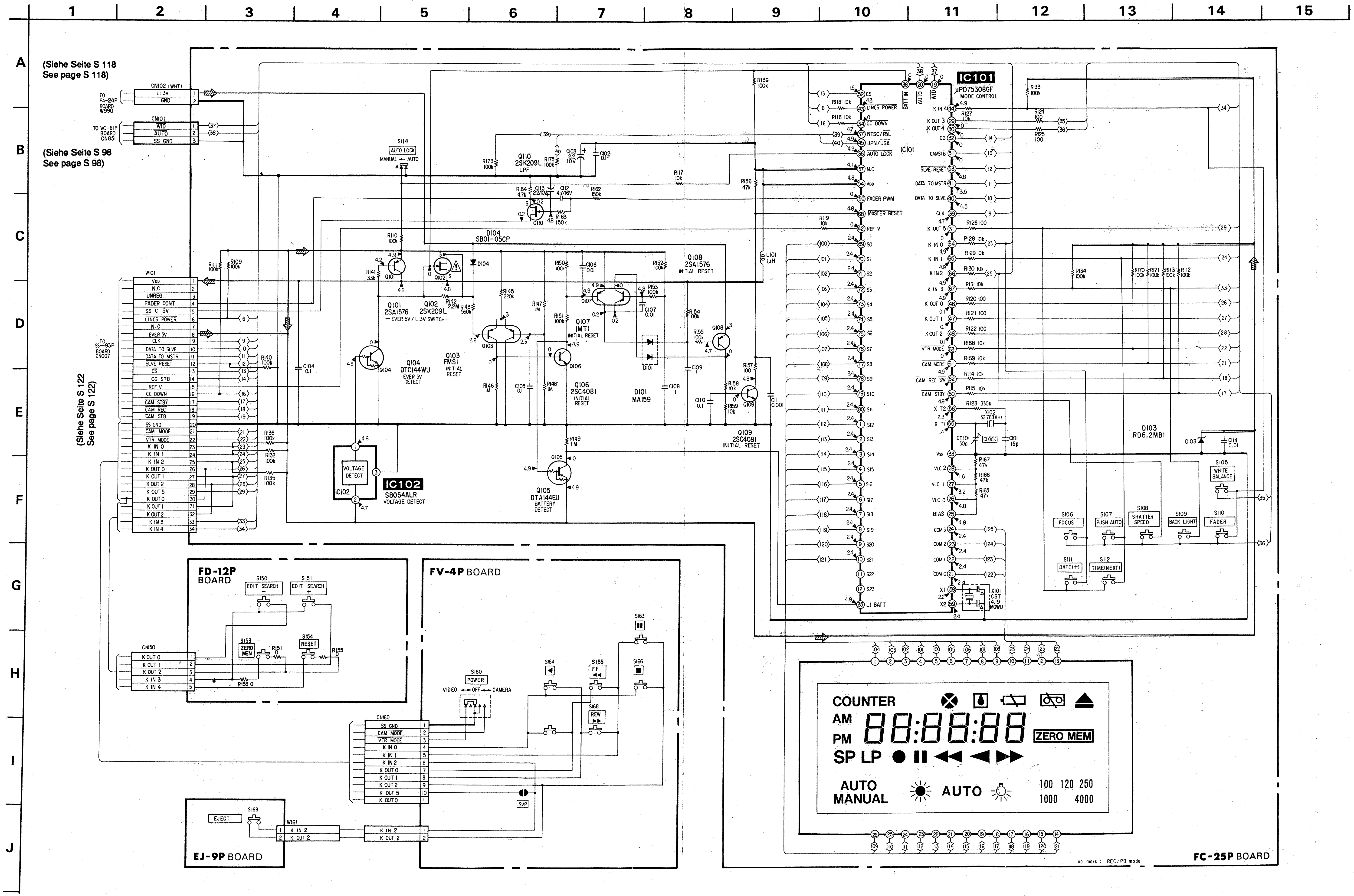
FC-25P BOARD(CONDUCTOR SIDE)

D101	D-3
D103	C-8
D104	E-11
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5


A
B
C
D
E
1
2
3
4
5
6
7
8
9
10
11
12
13
LCD101
26
22
17
14
FOCUS
WHITE BALANCE
SHATTER SPEED
TIME (NEXT)
AUTO LOCK
BACK LIGHT
PUSH AUTO
FADER
CN101
CN102
X102
Q101
Q102
Q103
Q108
Q110
D101
D104
S105
S107
1-630-448-
22
W101
IC101
D103
Q105
Q106
Q107
Q109
IC102
C104
C103
C108
C112
C113
1-630-448-
22

FC-25P (MODE CONTROL), FV-4P (POWER SWITCH, VTR FUNCTION SWITCH), FD-12P (CAMERA DATA FUNCTION SWITCH), EJ-9P (EJECT SWITCH) SCHEMATIC DIAGRAM

—Ref. No. FC-25P, FV-4P, FD-12P, EJ-9P BOARDS ; 4,000 series—



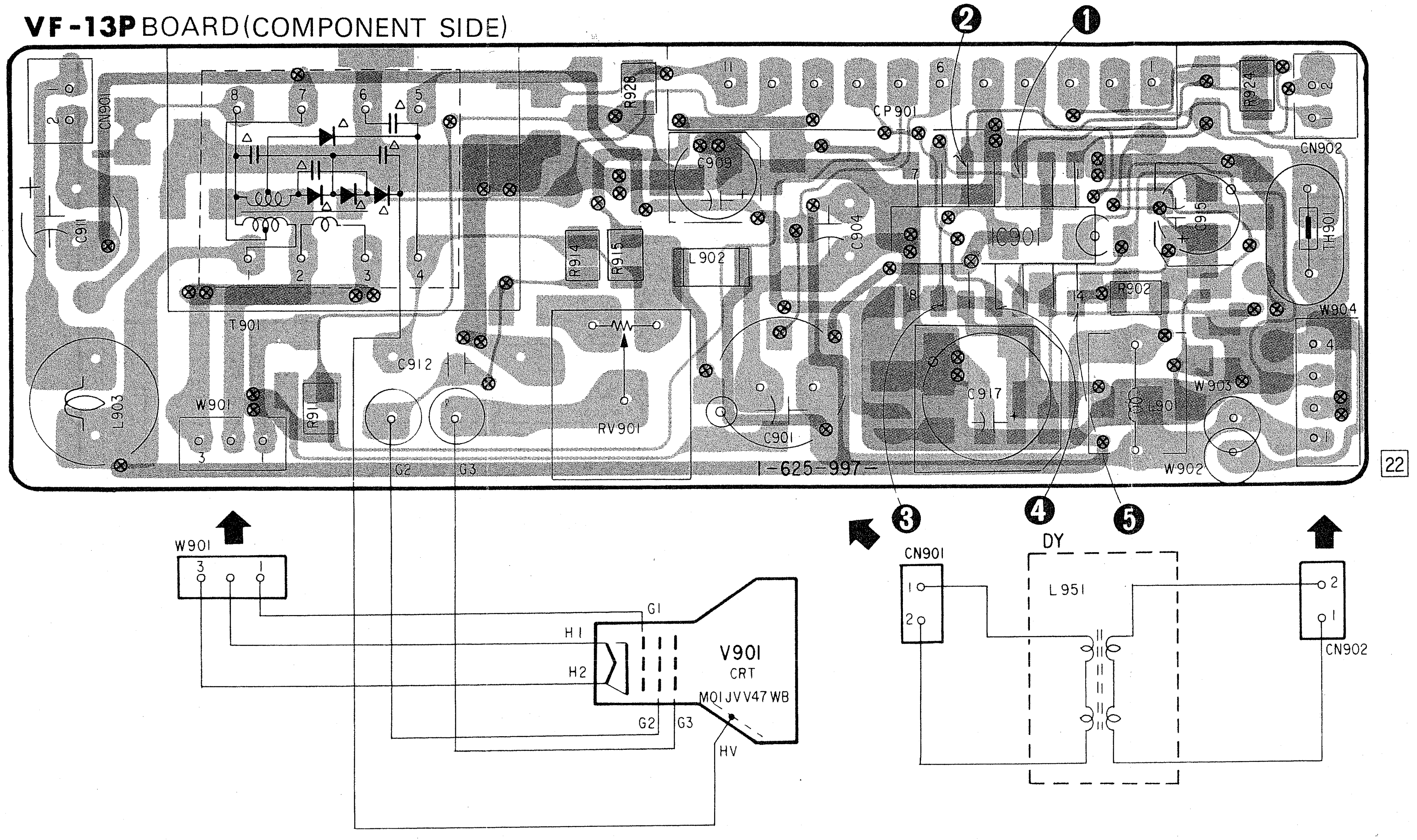
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
(Siehe Seite S 118
See page S 118)
TO PA-24P BOARD W990
CN102 (WHT)
LI 3V
GND
TO VC-61P BOARD CN851
CN101
WID
AUTO
SS GND
(Siehe Seite S 98
See page S 98)
TO SS-93P BOARD CN007
(Siehe Seite S 122
See page S 122)
W101
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K OUT0
K OUT1
K OUT2
K IN 3
K IN 4
S114
AUTO LOCK
MANUAL ← AUTO
Q110
2SK209L
LPF
Q101
2SA1576
Q102
2SK209L
— EVER 5V / LI3V SWITCH—
D104
SB01-05CP
Q103
FMS1
INITIAL RESET
Q104
DTC144WU
EVER 5V DETECT
Q107
IMT1
INITIAL RESET
Q106
2SC4081
INITIAL RESET
D101
MA159
Q108
2SA1576
INITIAL RESET
Q109
2SC4081
INITIAL RESET
Q105
DTA144EU
BATTERY DETECT
IC102
S8054ALR
VOLTAGE DETECT
VOLTAGE DETECT
L101
1μH
IC101
μPD75308GF
MODE CONTROL
CS
LINCS POWER
CC DOWN
NTSC/PAL
JPN/USA
AUTO LOCK
N.C
VDD
FADER PWM
MASTER RESET
REF V
S0
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
S22
S23
LI BATT
BATT IN
AUTO
WID
K IN 4
K OUT 3
K OUT 4
CG
CAMSTB
SLVE RESET
DATA TO MSTR
DATA TO SLVE
CLK
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
K OUT 0
K OUT 1
K OUT 2
VTR MODE
CAM MODE
CAM REC SW
CAM STBY
X T2
X T1
VSS
VLC 2
VLC 1
VLC 0
BIAS
COM 3
COM 2
COM 1
COM 0
X1
X2
X102
32.768KHz
CLOCK
X101
CST
4.19
MGWU
D103
RD6.2MB1
S105
WHITE BALANCE
S106
FOCUS
S107
PUSH AUTO
S108
SHATTER SPEED
S109
BACK LIGHT
S110
FADER
S111
DATE(+)
S112
TIME(NEXT)
FD-12P BOARD
S150
EDIT SEARCH
−
S151
EDIT SEARCH
+
S153
ZERO MEM
S154
RESET
CN150
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
FV-4P BOARD
S160
POWER
VIDEO ← OFF → CAMERA
S163
S164
S165
FF
S166
S168
REW
SVP
CN160
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K OUT 0
EJ-9P BOARD
EJECT
S169
W161
K IN 2
K OUT 2
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
no mark : REC/PB mode
FC-25P BOARD

VF-13P (VIEWFINDER), TL-18P (LED), TL-19P (LED) PRINTED WIRING BOARDS

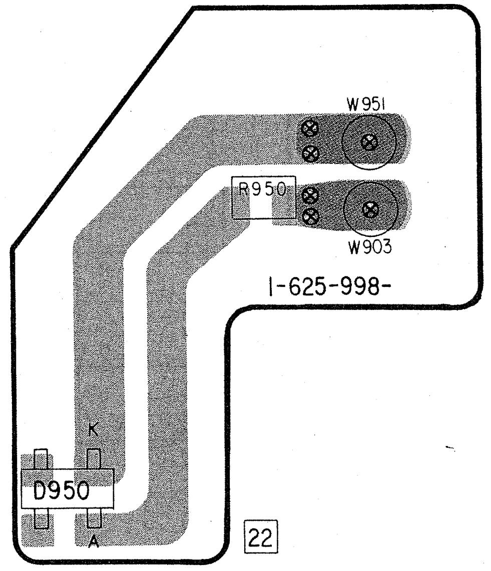
—Ref. No. VF-13P, TL-18P, TL-19P BOARDS ; 5,000 series—

- ⊗ : Through hole.

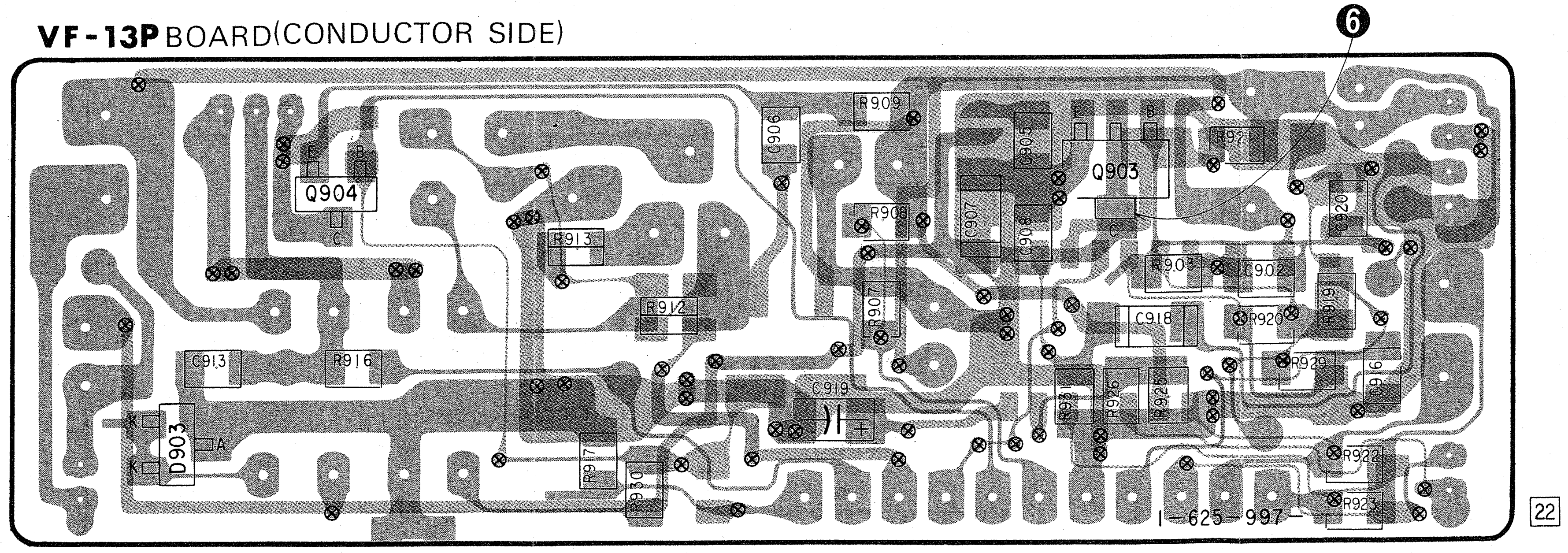
VF-13P BOARD(COMPONENT SIDE)


❷
❶
CN901
T901
W901
L903
C911
C912
R914
R915
L902
RV901
G2
G3
C909
R928
CP901
C904
IC901
C917
C901
R902
R924
CN902
TH901
W904
W903
L901
W902
1-625-997-
22
❸
❹
❺
DY
L951
W901
G1
H1
H2
V901
CRT
M01JVV47WB
G2
G3
HV
CN901
CN902

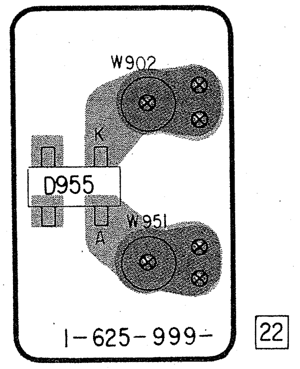
TL-18P BOARD(COMPONENT SIDE)


W951
R950
W903
1-625-998-
K
D950
A
22

VF-13P BOARD(CONDUCTOR SIDE)

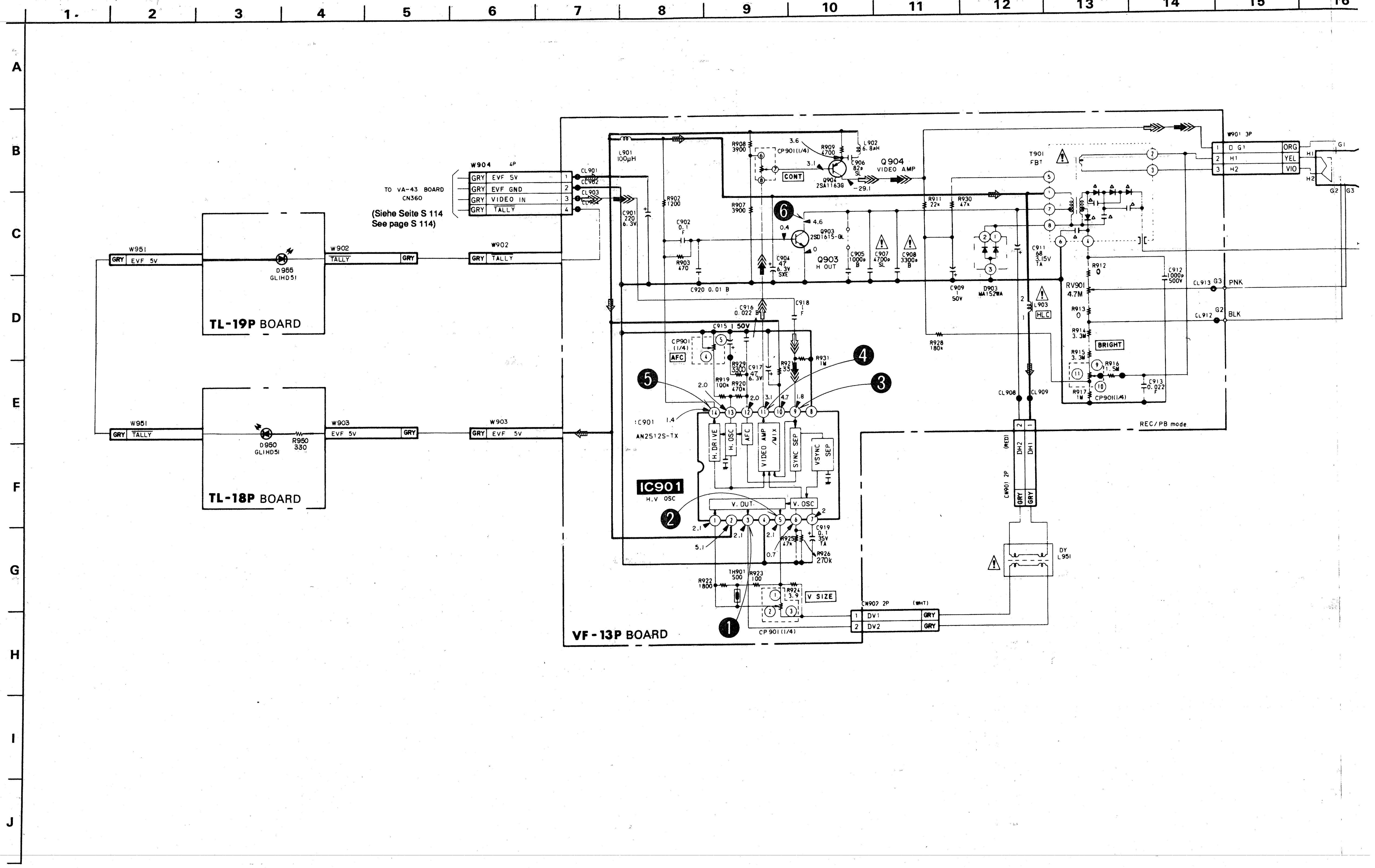

❻
Q904
R909
C906
C905
Q903
R921
R913
R908
C907
C908
R903
C902
C920
R912
R907
C918
R920
R919
C913
R916
C919
R931
R926
R925
R929
C916
D903
K
A
R917
R930
R922
R923
1-625-997-
22

TL-19P BOARD(COMPONENT SIDE)


W902
K
D955
A
W951
1-625-999-
22

VF-13P (VIEWFINDER), TL-18P (LED), TL-19P (LED) SCHEMATIC DIAGRAM

—Ref. No. VF-13P, TL-18P, TL-19P BOARDS ; 5,000 series—



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16
A
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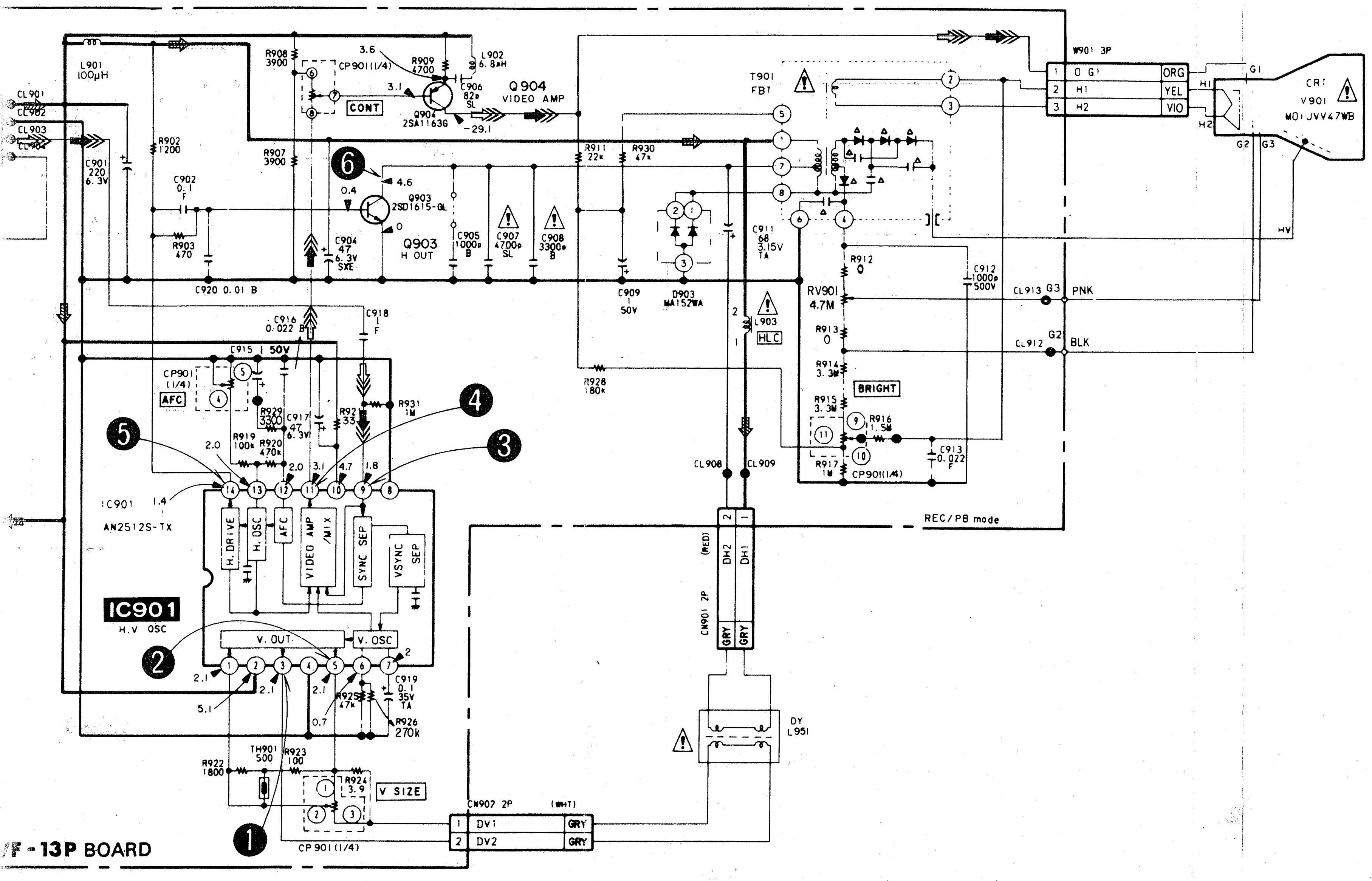
C
D
E
F
G
H
I
J
W951
GRY EVF 5V
D955
GL1HD51
W902
TALLY
GRY
TL-19P BOARD
W951
GRY TALLY
D950
GL1HD51
R950
330
W903
EVF 5V
TL-18P BOARD
W904 4P
GRY EVF 5V
GRY EVF GND
GRY VIDEO IN
GRY TALLY
TO VA-43 BOARD
CN360
(Siehe Seite S 114
See page S 114)
CL901
CL902
CL903
CL904
L901
100μH
C901
220
6.3V
R902
1200
C902
0.1
F
R903
470
C920 0.01 B
R908
3900
R907
3900
CP901(1/4)
CONT
R909
4700
Q904
2SA1163G
VIDEO AMP
L902
6.8μH
C906
82p
SL
Q903
2SD1615-GL
H OUT
C904
47
6.3V
SXE
C905
1000p
B
C907
4700p
SL
C908
3300p
B
R911
22k
R930
47k
T901
FBT
C909
1
50V
D903
MA152WA
C911
68
3.15V
TA
L903
HLC
R928
180k
R912
0
RV901
4.7M
R913
0
R914
3.3M
BRIGHT
R915
3.3M
R916
1.5M
R917
1M
CP901(1/4)
C913
0.022
F
C912
1000p
500V
CL913 G3 PNK
CL912 G2 BLK
CL908
CL909
W901 3P
D G1
H1
H2
ORG
YEL
VIO
G1
G2
G3
REC/PB mode
C916
0.022
C918
1
F
C915 1 50V
CP901
(1/4)
AFC
R929
3300
R919
100k
R920
470k
C917
47
6.3V
R927
33
R931
1M
IC901
AN2512S-TX
IC901
H.V OSC
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V. OUT
V. OSC
C919
0.1
35V
TA
R925
47k
R926
270k
R922
1800
TH901
500
R923
100
R924
3.9
V SIZE
CP901(1/4)
CN902 2P (WHT)
DV1
DV2
GRY
CN901 2P (RED)
DH2
DH1
DY
L951
VF-13P BOARD
❶
❷
❸
❹
❺
❻



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17
18
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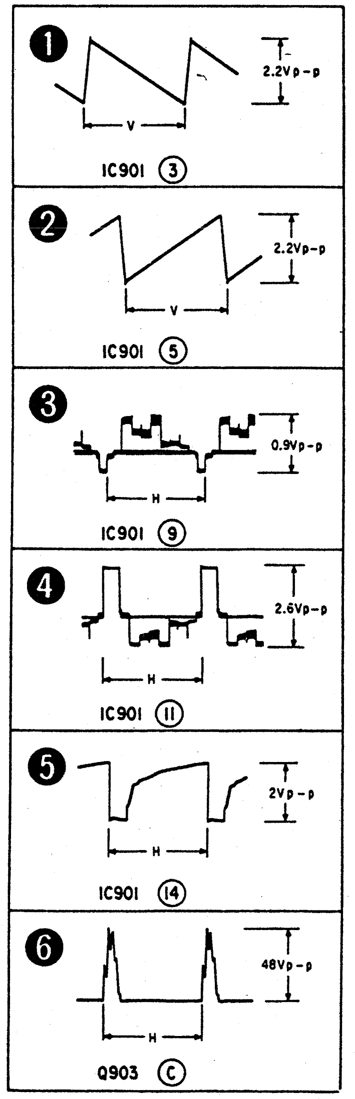
21
22
23
A
B
C
D
E
F
G
H
I
J
L901 100μH
CL901
CL902
CL903
CL904
C901 220 6.3V
R902 1200
C902 0.1 F
R903 470
C920 0.01 B
R908 3900
R907 3900
CP901(1/4)
CONT
R909 4700
3.6
3.1
Q904 2SA1163G
Q904 VIDEO AMP
L902 6.8μH
C906 82p SL
-29.1
Q903 2SD1615-GL
Q903 H OUT
4.6
0.4
0
C904 47 6.3V SXE
C905 1000p B
C907 4700p SL
C908 3300p B
R911 22k
R930 47k
C909 1 50V
D903 MA152WA
T901 FBT
C911 68 3.15V TA
L903
HLC
W901 3P
O G1
H1
H2
ORG
YEL
VIO
CRT V901 M01JVV47WB
G1
G2
G3
HV
R912 0
C912 1000p 500V
RV901 4.7M
CL913
CL912
PNK
BLK
R913 0
R914 3.3M
BRIGHT
R915 3.3M
R916 1.5M
R917 1M
CP901(1/4)
C913 0.022 F
R928 180k
C916 0.022 B
C918 1 F
C915 1 50V
CP901 (1/4)
AFC
R929 3300
C917 47 6.3V
R921 33
R931 1M
R919 100k
R920 470k
IC901 AN2512S-TX
IC901 H.V OSC
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V. OUT
V. OSC
C919 0.1 35V TA
R925 47k
R926 270k
R922 1800
TH901 500
R923 100
R924 3.9
V SIZE
CP 901(1/4)
CN907 2P
DV1
DV2
GRY
(WHT)
CN901 2P
DH2
DH1
(RED)
CL908
CL909
DY L951
REC/PB mode
VF-13P BOARD

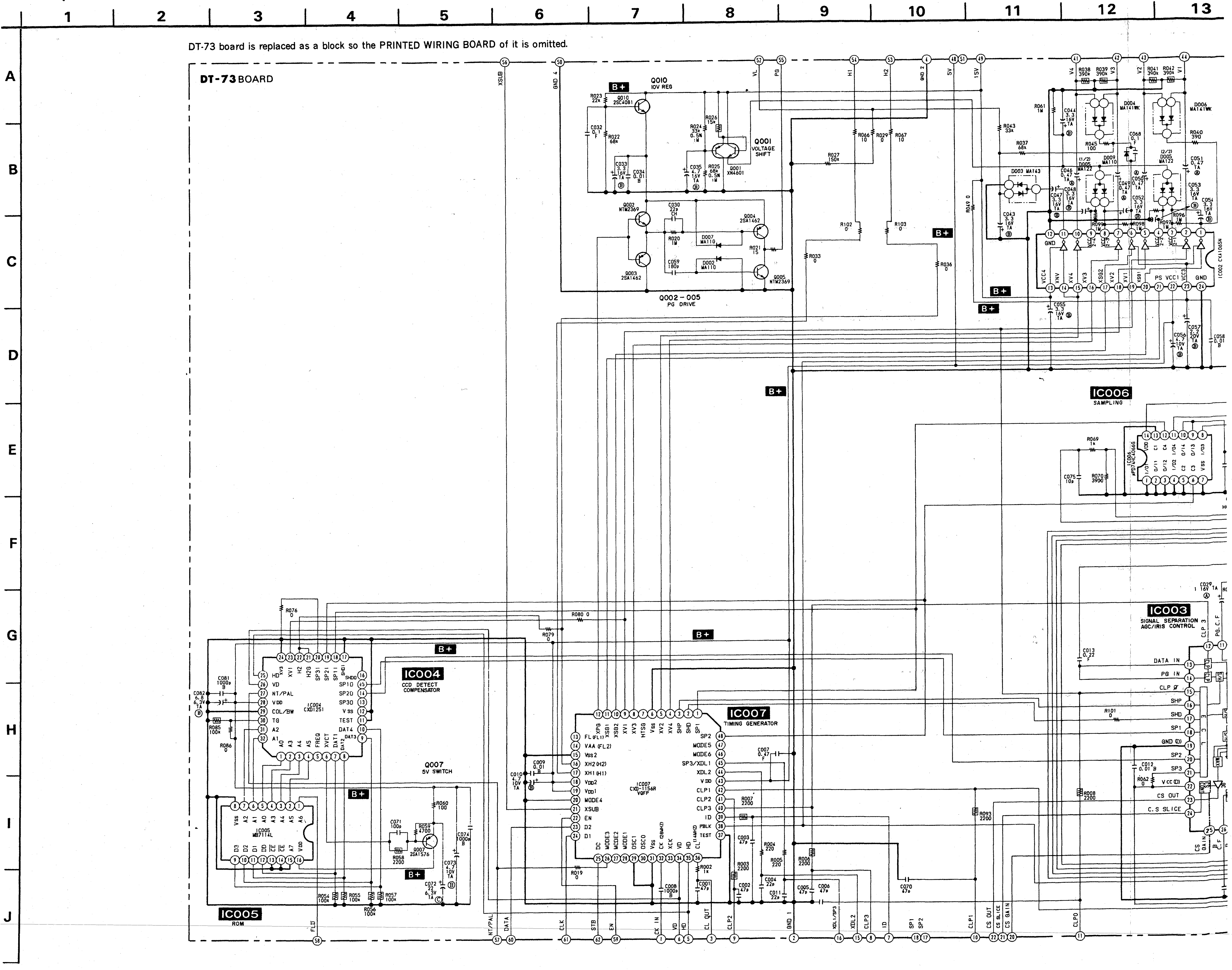
VF-13P BOARD



- **Signal path**

➡: REC Y/CHROMA Signal
⇨: PB Y/CHROMA Signal

DT-73 (CCD DRIVE/TIMING GENERATOR)



DT-73 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

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G
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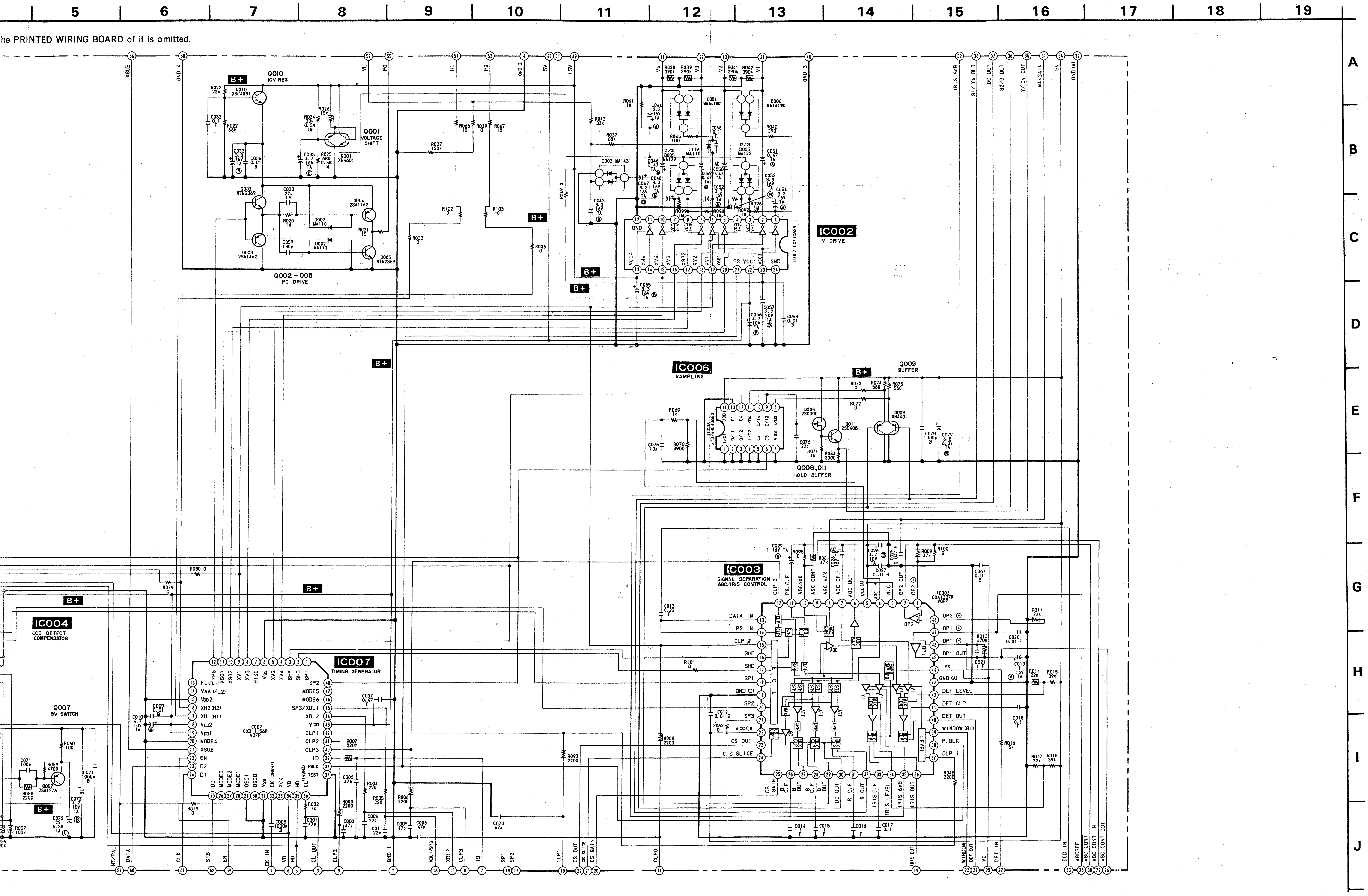
I
J
DT-73 BOARD
B+
Q010 10V REG
Q010 2SC4081
Q001 VOLTAGE SHIFT
Q001 XN4601
Q002 NTM2369
Q003 2SA1462
Q004 2SA1462
Q005 NTM2369
Q002 – 005 PG DRIVE
D003 MA143
D004 MA141WK
D006 MA141WK
D005 MA122
D009 MA110
IC002 CXA1065N
IC006 SAMPLING
IC006 μPD74HC4066G
IC003 SIGNAL SEPARATION AGC/IRIS CONTROL
IC004 CCD DETECT COMPENSATOR
IC004 CXD1251
IC007 TIMING GENERATOR
IC007 CXD-1156R VQFP
IC005 ROM
IC005 MB7114L
Q007 5V SWITCH
Q007 2SA1576
XSUB
GND 4
VL
PG
H1
H2
GND 2
5V
15V
V4
V3
V2
V1
DATA IN
PG IN
CLP Ø
SHP
SHD
SP1
GND (D)
SP2
SP3
V CC (D)
CS OUT
C.S SLICE
FLD
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN
CLP0

he PRINTED WIRING BOARD of it is omitted.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16
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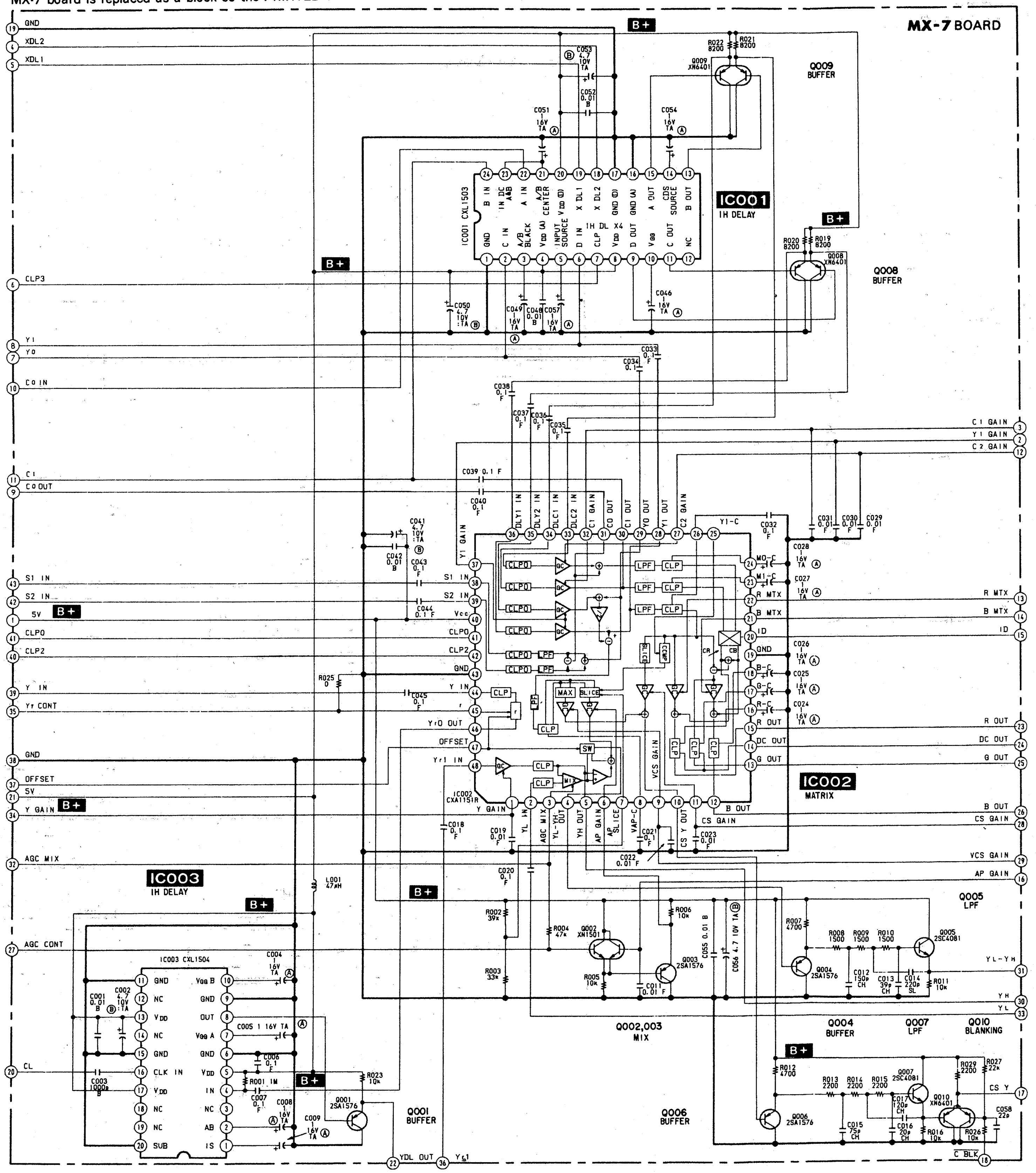
18
19
A
B
C
D
E
F
G
H
I
J
XSUB
GND 4
VL
PG
H1
H2
GND 2
5V
15V
V4
V3
V2
V1
GND 3
IRIS 6dB
S1/Ya OUT
DC OUT
S2/B OUT
Y/Cy OUT
MAXGAIN
5V
GND (A)
B+
Q010
10V REG
Q001
VOLTAGE SHIFT
Q002 - 005
PG DRIVE
D003 MA143
D004 MA141WK
D006 MA141WK
IC002
V DRIVE
IC002 CXA1065N
IC006
SAMPLING
Q009
BUFFER
Q008,011
HOLD BUFFER
IC003
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC003 CXA1337R VQFP
IC004
CCD DETECT
COMPENSATOR
IC007
TIMING GENERATOR
IC007 CXD-1156R VQFP
Q007
5V SWITCH
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN
CLPO
IRIS OUT
WINDOW
DET OUT
VG
DET IN
CCD IN
AGCREF
AGC CONT
AGC CONT IN
AGC CONT OUT

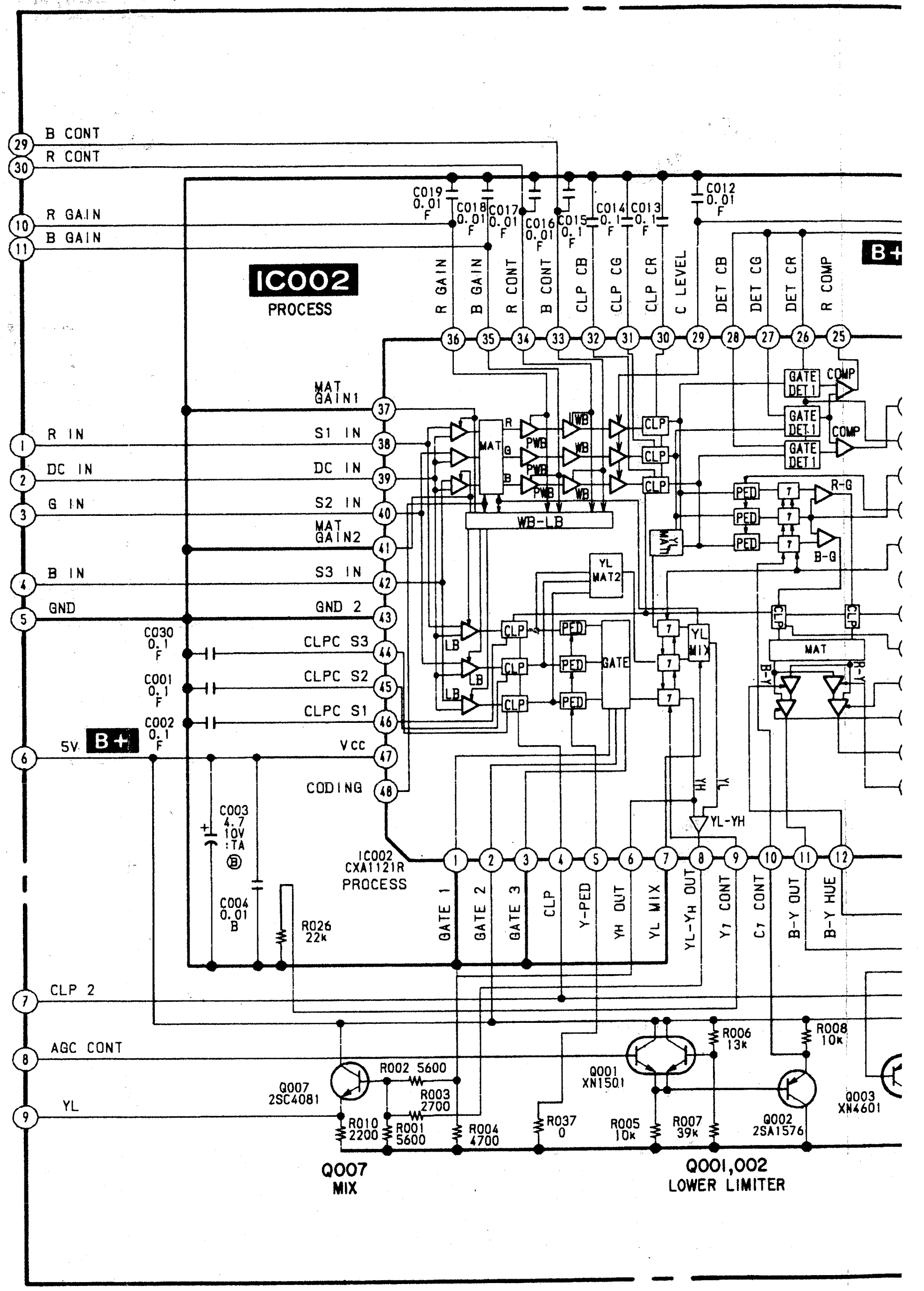
S 141

S 142

MX-7 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

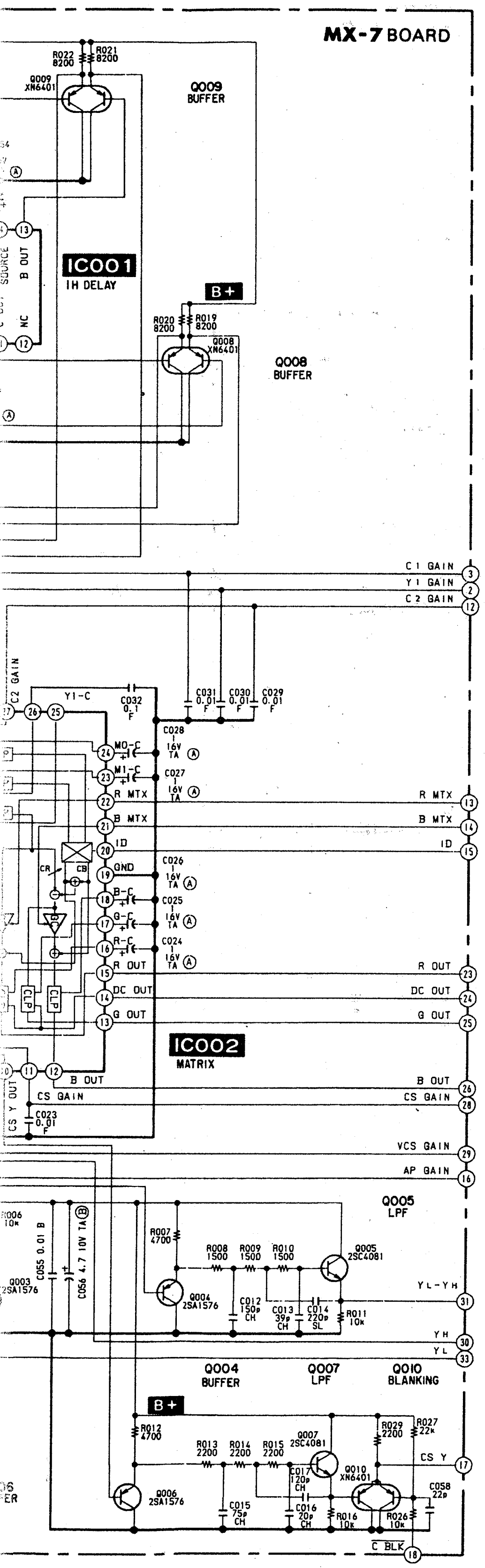

MX-7 BOARD
IC001 1H DELAY
IC001 CXL1503
IC002 MATRIX
IC002 CXA1151R
IC003 1H DELAY
IC003 CXL1504
Q001 BUFFER
Q002,003 MIX
Q004 BUFFER
Q005 LPF
Q006 BUFFER
Q007 LPF
Q008 BUFFER
Q009 BUFFER
Q010 BLANKING
B+
GND
XDL 2
XDL 1
CLP3
Y1
Y0
C0 IN
C1
C0 OUT
S1 IN
S2 IN
5V
CLP0
CLP2
Y IN
Yr CONT
OFFSET
Y GAIN
AGC MIX
AGC CONT
CL
YDL OUT
C1 GAIN
Y1 GAIN
C2 GAIN
R MTX
B MTX
ID
R OUT
DC OUT
G OUT
B OUT
CS GAIN
VCS GAIN
AP GAIN
YL-YH
YH
YL
CS Y
C BLK

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

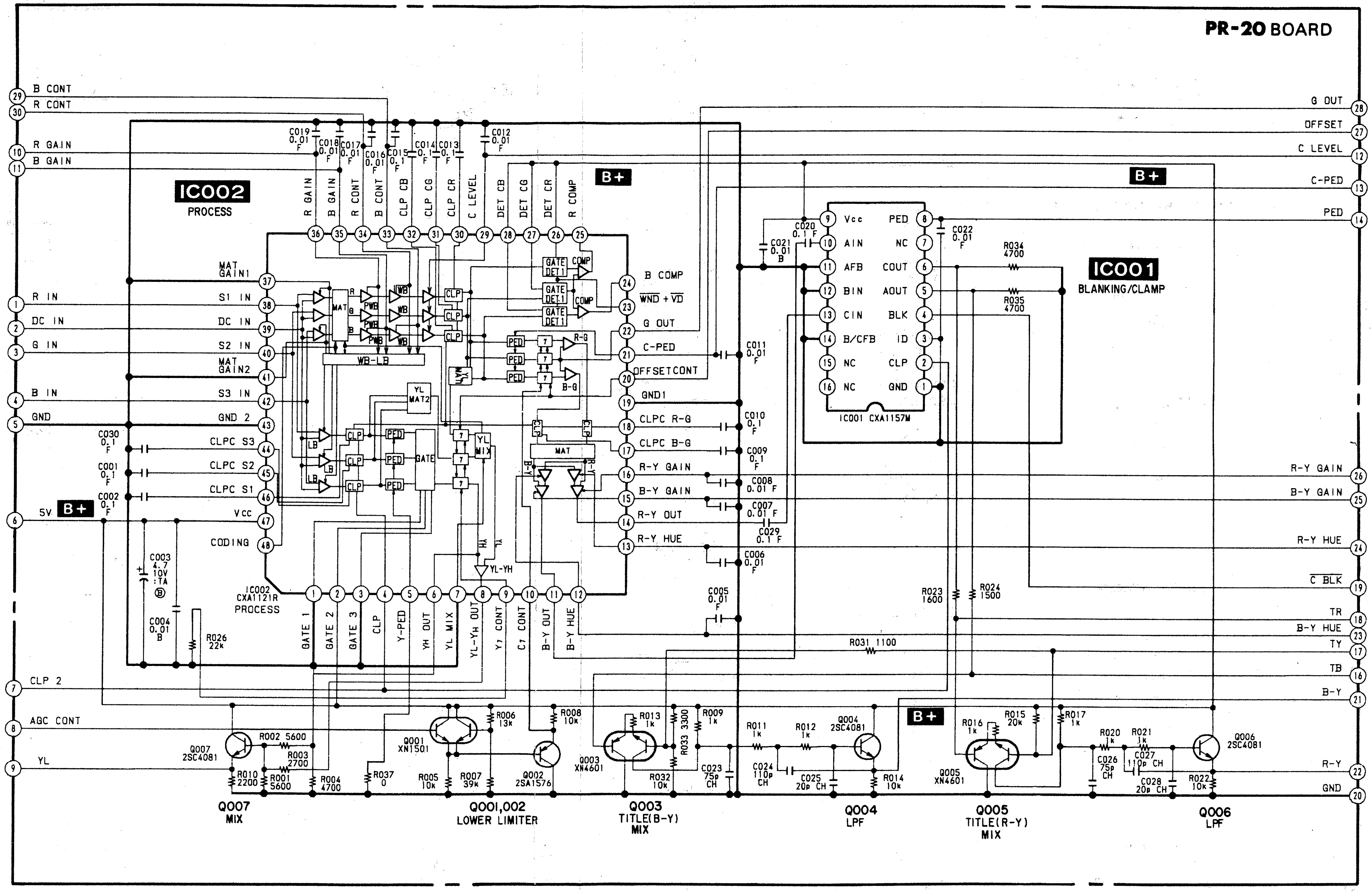

IC002 PROCESS
IC002 CXA1121R PROCESS
B CONT
R CONT
R GAIN
B GAIN
R IN
DC IN
G IN
B IN
GND
5V
B+
CLP 2
AGC CONT
YL
Q007 MIX
Q001,002 LOWER LIMITER

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

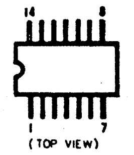

MX-7 BOARD
Q009 XN6401
Q009 BUFFER
IC001
1H DELAY
Q008 XN6401
Q008 BUFFER
B+
C1 GAIN
Y1 GAIN
C2 GAIN
R MTX
B MTX
ID
R OUT
DC OUT
G OUT
IC002
MATRIX
B OUT
CS GAIN
VCS GAIN
AP GAIN
Q005 LPF
Q004 2SA1576
Q005 2SC4081
YL-YH
YH
YL
Q004 BUFFER
Q007 LPF
Q010 BLANKING
Q007 2SC4081
Q010 XN6401
Q006 2SA1576
CS Y
C BLK

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

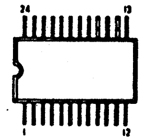

PR-20 BOARD
B CONT
R CONT
R GAIN
B GAIN
IC002
PROCESS
B+
R IN
DC IN
G IN
B IN
GND
5V
CLP 2
AGC CONT
YL
MAT GAIN1
S1 IN
DC IN
S2 IN
MAT GAIN2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
Vcc
CODING
IC002
CXA1121R
PROCESS
GATE 1
GATE 2
GATE 3
CLP
Y-PED
YH OUT
YL MIX
YL-YH OUT
Y1 CONT
C1 CONT
B-Y OUT
B-Y HUE
R GAIN
B GAIN
R CONT
B CONT
CLP CB
CLP CG
CLP CR
C LEVEL
DET CB
DET CG
DET CR
R COMP
B COMP
WND + VD
G OUT
C-PED
OFFSET CONT
GND1
CLPC R-G
CLPC B-G
R-Y GAIN
B-Y GAIN
R-Y OUT
R-Y HUE
WB-LB
MAT
PWB
WB
CLP
PED
GATE
COMP
LB
YL MAT2
YL MIX
YL-YH
IC001
BLANKING/CLAMP
Vcc
AIN
AFB
BIN
CIN
B/CFB
NC
PED
COUT
AOUT
BLK
ID
CLP
GND
IC001 CXA1157M
G OUT
OFFSET
C LEVEL
C-PED
PED
R-Y GAIN
B-Y GAIN
R-Y HUE
C BLK
TR
B-Y HUE
TY
TB
B-Y
R-Y
GND
Q007 2SC4081
Q007 MIX
Q001 XN1501
Q002 2SA1576
Q001,002 LOWER LIMITER
Q003 XN4601
Q003 TITLE(B-Y) MIX
Q004 2SC4081
Q004 LPF
Q005 XN4601
Q005 TITLE(R-Y) MIX
Q006 2SC4081
Q006 LPF

4-3. SEMICONDUCTORS

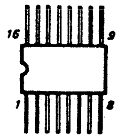
AN2512S
TC40H008F
μPD4066BG


14
8
1
7
(TOP VIEW)

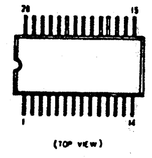
CX20114


24
13
12
(Top view)

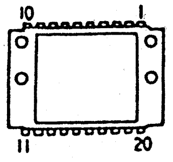
CX20115A
TC4053BF
μPD6145G-601



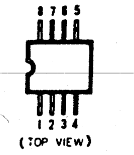
CXK58256MF-15LL


28
15
1
14
(TOP VIEW)

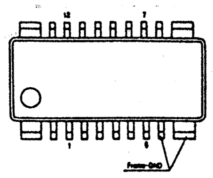
ICX027BK-2



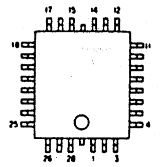
LA7293
MC34182MR
NJM2233AM
RC3414M
μPC358G2
μPC393G2


8 7 6 5
1 2 3 4
(TOP VIEW)

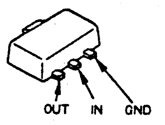
LB1631M



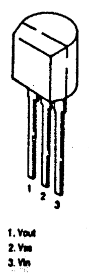
MC146805F2FPSC8253-3F



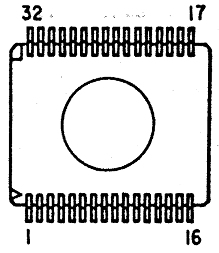
S-8054ALR-LN-S



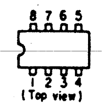
S-81350AG-REG


1
2
3
1. Vout
2. Vss
3. Vin

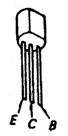
SBX1505-21



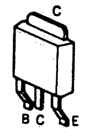
μPC311G2


8 7 6 5
1 2 3 4
(Top view)

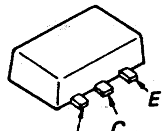
2SA733-K



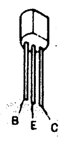
2SA1341



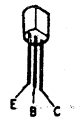
2SA1416-S
2SB804-AW
2SB1121
2SC3646-S
2SD1615



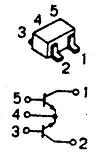
2SA1611-M6



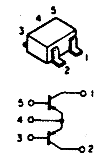
2SB926-T



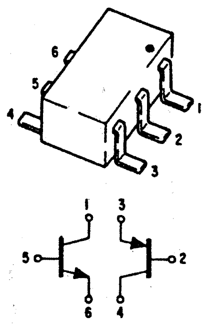
FMG2
FMW1
XN1213
XN1216



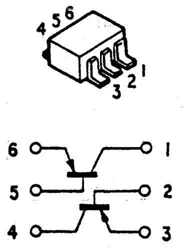
FMS1
FMY3
XN1113



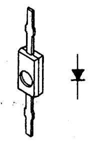
IMD2
XN4601


6
5
4
1
2
3
1
3
5
2
6
4

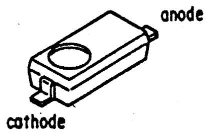
IMT1US


4
5
6
1
2
3
6
1
5
2
4
3

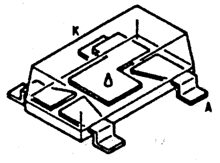
1T32-2



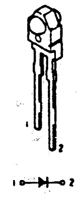
1T33C-01


anode
cathode

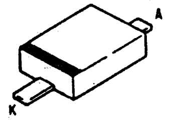
GL1HD51



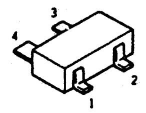
GL452S



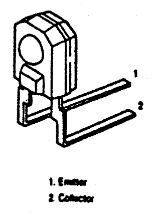
MA110



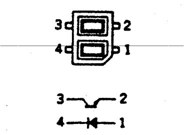
DWA010



PT480FI

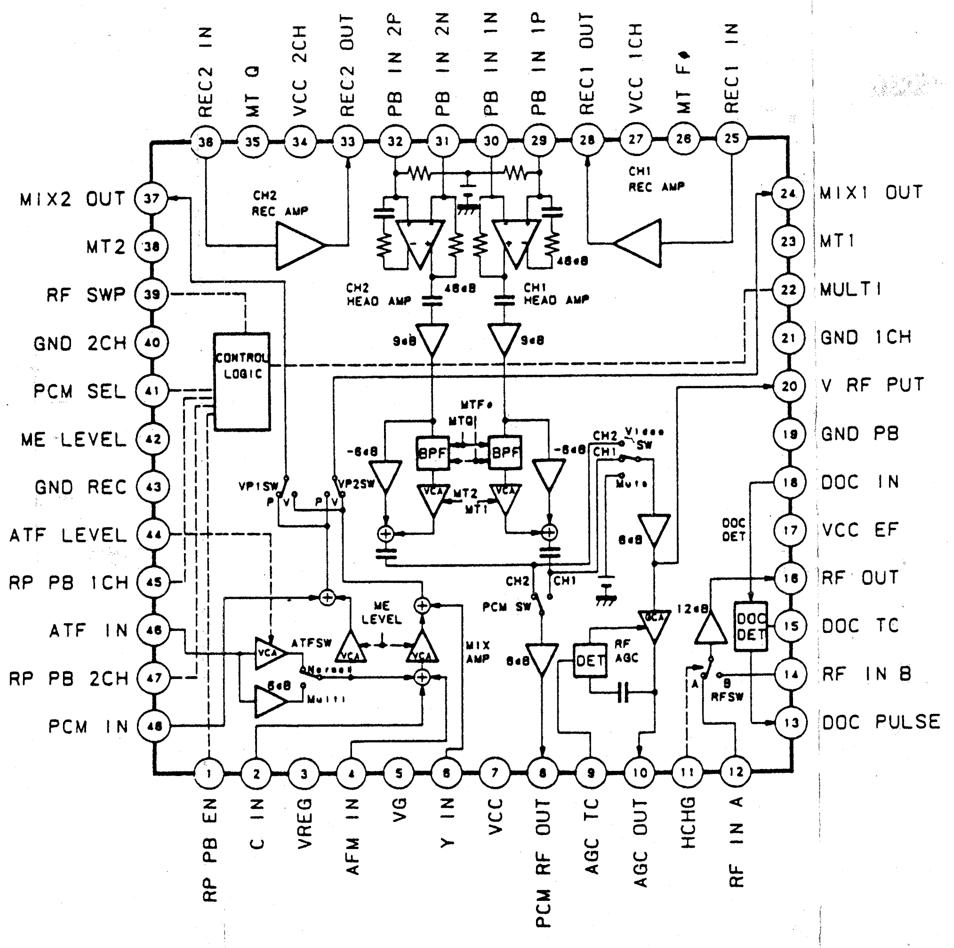

1
2
1. Emitter
2. Collector

TLP907-0

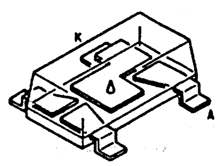


• VIDEO/AUDIO BLOCK IC BLOCK DIAGRAMS (FOR IC BLOCK DIAGRAM, SEE PAGE 115 to 119.)

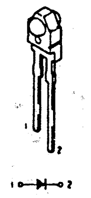
IC301 (SS-93P)
CXA1202Q-Z/
CXA1202R


REC2 IN
MT Q
VCC 2CH
REC2 OUT
PB IN 2P
PB IN 2N
PB IN IN
PB IN 1P
REC1 OUT
VCC 1CH
MT F♦
REC1 IN
36
35
34
33
32
31
30
29
28
27
26
25
MIX2 OUT
MT2
RF SWP
GND 2CH
PCM SEL
ME LEVEL
GND REC
ATF LEVEL
RP PB 1CH
ATF IN
RP PB 2CH
PCM IN
37
38
39
40
41
42
43
44
45
46
47
48
MIX1 OUT
MT1
MULTI
GND 1CH
V RF PUT
GND PB
DOC IN
VCC EF
RF OUT
DOC TC
RF IN B
DOC PULSE
24
23
22
21
20
19
18
17
16
15
14
13
1
2
3
4
5
6
7
8
9
10
11
12
RP PB EN
C IN
VREG
AFM IN
VG
Y IN
VCC
PCM RF OUT
AGC TC
AGC OUT
HCHG
RF IN A
CH2 REC AMP
CH1 REC AMP
48dB
CH2 HEAD AMP
CH1 HEAD AMP
9dB
9dB
CONTROL LOGIC
MTF♦
MTQ
BPF
BPF
-6dB
-6dB
VCA
VCA
MT2
MT1
VP1SW
VP2SW
P V
P V
CH2 Video SW
CH1
Mute
6dB
DOC DET
CH2
CH1
PCM SW
ME LEVEL
ATFSW
VCA
VCA
VCA
Normal
6dB
Multi
MIX AMP
6dB
DET
RF AGC
GCA
12dB
DOC DET
A
B
RFSW

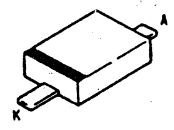
GL1HD51



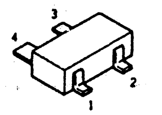
GL452S



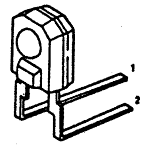
MA110



DWA010

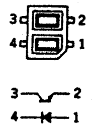


PT480FI



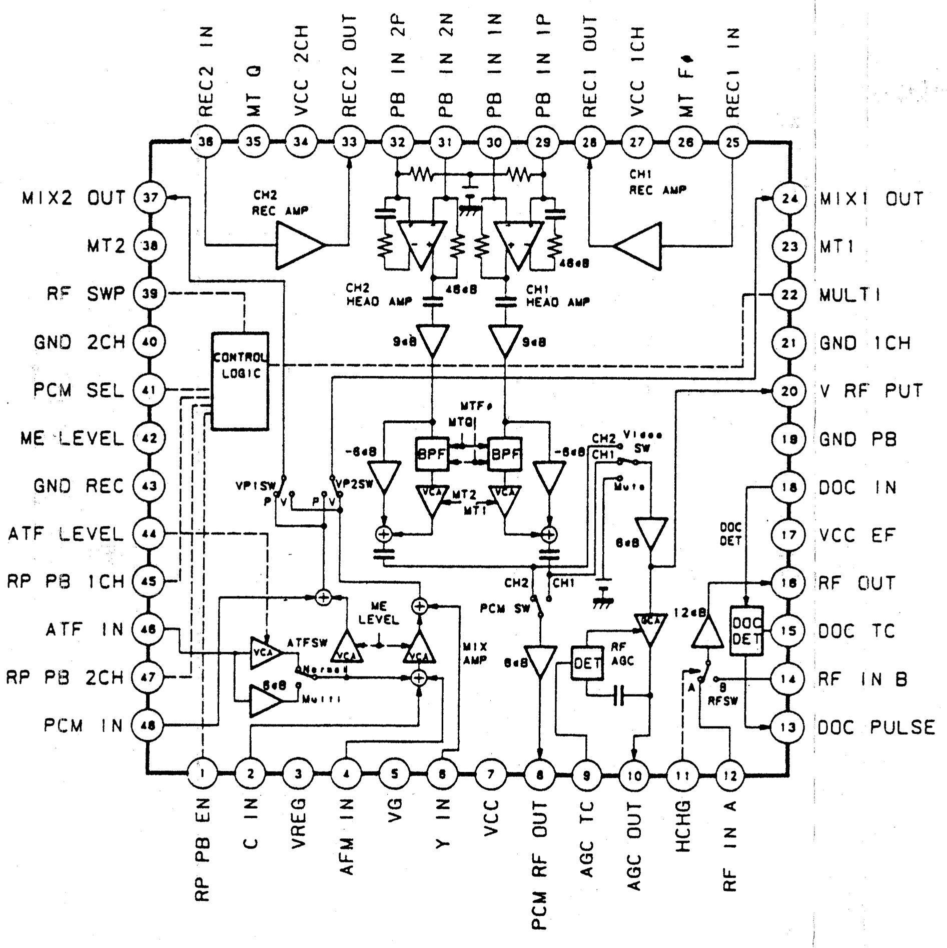
1. Emitter
2. Collector

TLP907-0

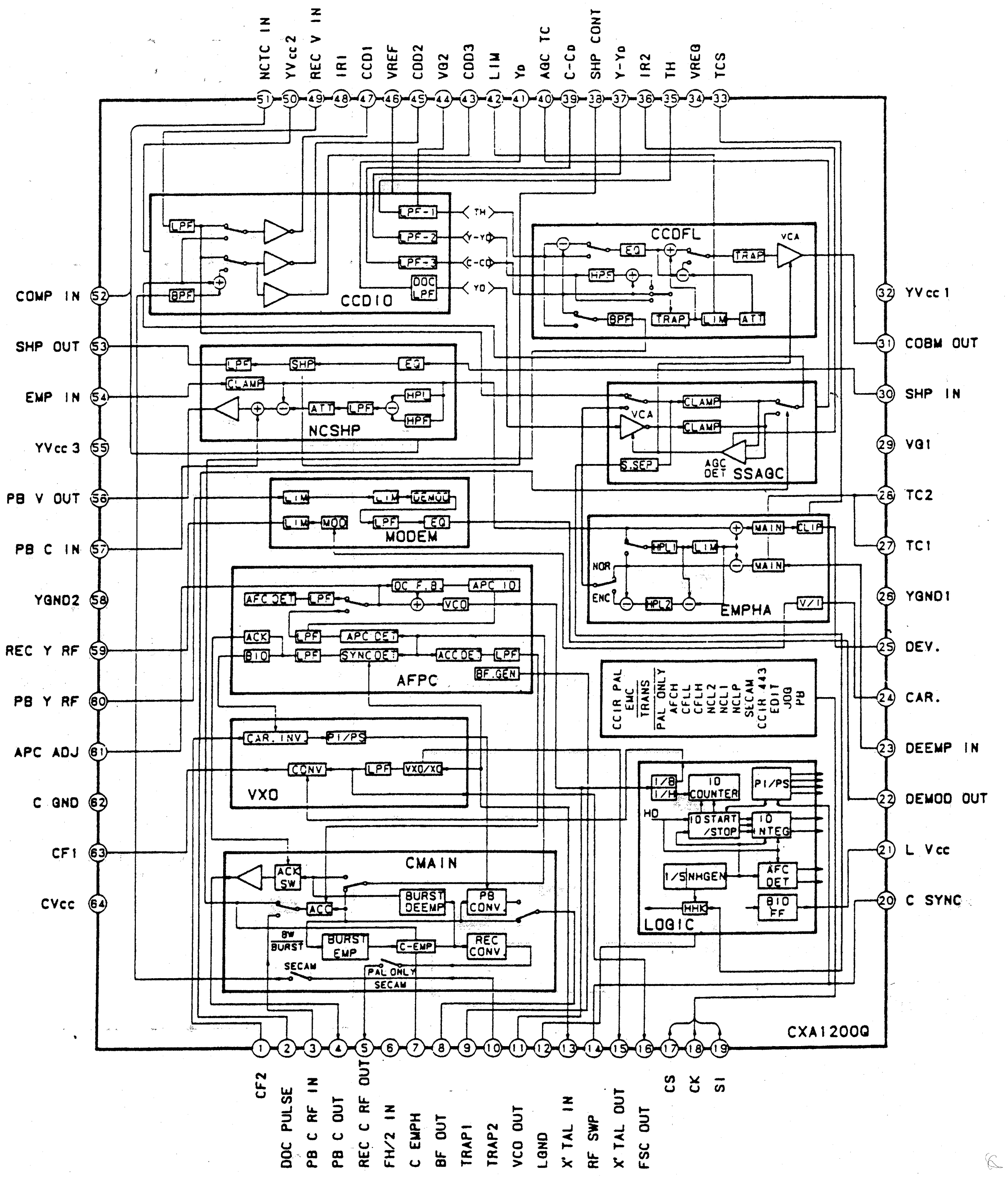


• VIDEO/AUDIO BLOCK IC BLOCK DIAGRAMS (FOR IC BLOCK DIAGRAM, SEE PAGE 115 to 119.)

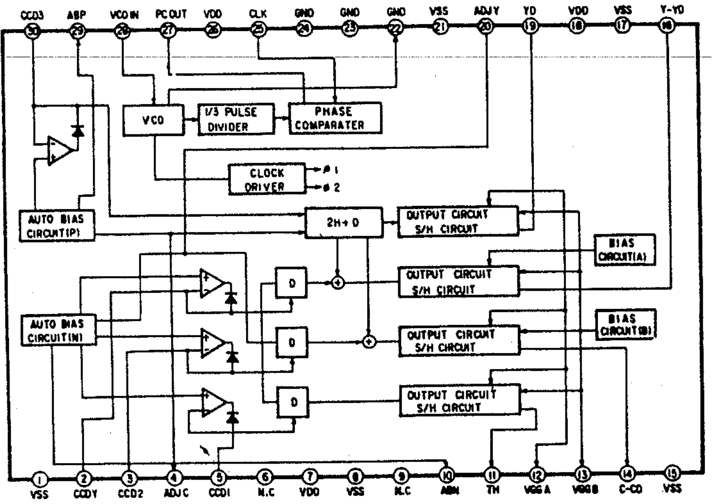
IC301 (SS-93P)
CXA1202Q-Z/
CXA1202R


REC2 IN 36
MT Q 35
VCC 2CH 34
REC2 OUT 33
PB IN 2P 32
PB IN 2N 31
PB IN N 30
PB IN 1P 29
REC1 OUT 28
VCC 1CH 27
MT F# 26
REC1 IN 25
MIX2 OUT 37
MT2 38
RF SWP 39
GND 2CH 40
PCM SEL 41
ME LEVEL 42
GND REC 43
ATF LEVEL 44
RP PB 1CH 45
ATF IN 46
RP PB 2CH 47
PCM IN 48
24 MIX1 OUT
23 MT1
22 MULTI
21 GND 1CH
20 V RF PUT
19 GND PB
18 DOC IN
17 VCC EF
16 RF OUT
15 DOC TC
14 RF IN B
13 DOC PULSE
1 RP PB EN
2 C IN
3 VREG
4 AFM IN
5 VG
6 Y IN
7 VCC
8 PCM RF OUT
9 AGC TC
10 AGC OUT
11 HCHG
12 RF IN A
CH2 REC AMP
CH1 REC AMP
CH2 HEAD AMP
CH1 HEAD AMP
48dB
9dB
CONTROL LOGIC
MTF#
MTQ
BPF
-6dB
VP1SW
VP2SW
MT2
MT1
VCA
CH2 Video SW
CH1
Mute
6dB
DOC DET
ATFSW
ME LEVEL
MIX AMP
Normal
Multi
PCM SW
DET
RF AGC
12dB
RFSW

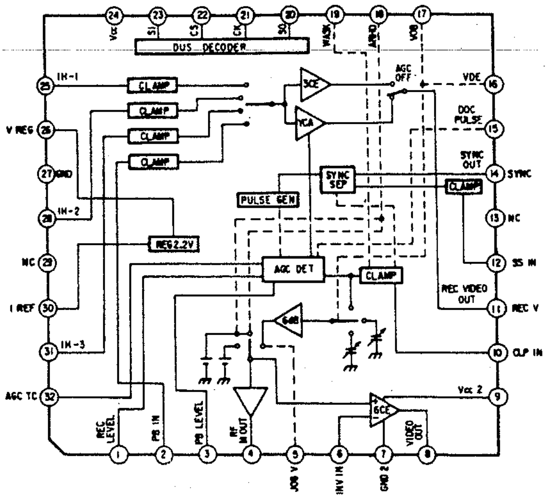
IC360 (VA-43) CXA1200Q


NCTC IN 51
YVcc2 50
REC V IN 49
IR1 48
CCD1 47
VREF 46
CDD2 45
VG2 44
CDD3 43
LIM 42
Yo 41
AGC TC 40
C-Co 39
SHP CONT 38
Y-Yo 37
IR2 36
TH 35
VREG 34
TCS 33
COMP IN 52
SHP OUT 53
EMP IN 54
YVcc3 55
PB V OUT 56
PB C IN 57
YGND2 58
REC Y RF 59
PB Y RF 60
APC ADJ 61
C GND 62
CF1 63
CVcc 64
32 YVcc1
31 COBM OUT
30 SHP IN
29 VG1
28 TC2
27 TC1
26 YGND1
25 DEV.
24 CAR.
23 DEEMP IN
22 DEMOD OUT
21 L Vcc
20 C SYNC
1 CF2
2 DOC PULSE
3 PB C RF IN
4 PB C OUT
5 REC C RF OUT
6 FH/2 IN
7 C EMPH
8 BF OUT
9 TRAP1
10 TRAP2
11 VCO OUT
12 LGND
13 X'TAL IN
14 RF SWP
15 X'TAL OUT
16 FSC OUT
17 CS
18 CK
19 SI
LPF
BPF
CCD10
LPF-1
LPF-2
LPF-3
DOC LPF
TH
Y-Yo
C-Co
Yo
CCDFL
EQ
HPF
TRAP
LIM
ATT
VCA
SHP
CLAMP
NCSHP
S.SEP
AGC DET
SSAGC
MOD
DEMOD
MODEM
MAIN
CLIP
HPL1
HPL2
NOR
ENC
EMPHA
V/I
AFC DET
DC F.B
APC ID
VCO
ACK
BID
APC DET
SYNC DET
ACC DET
BF GEN
AFPC
CCIR PAL
EMC
TRANS
PAL ONLY
AFCH
CFLH
NCL2
NCL1
NCLP
SECAM
CCIR 443
EDIT
JOG
PB
CAR. INV
P1/PS
CONV
VXO/XO
VXO
I/8
I/H
ID COUNTER
HD
ID START/STOP
ID INTEG
I/SNHGEN
HHK
AFC DET
BID FF
LOGIC
CMAIN
ACK SW
ACC
BURST DEEMP
PB CONV
BW BURST
BURST EMP
C-EMP
REC CONV
SECAM
PAL ONLY
SECAM
CXA1200Q

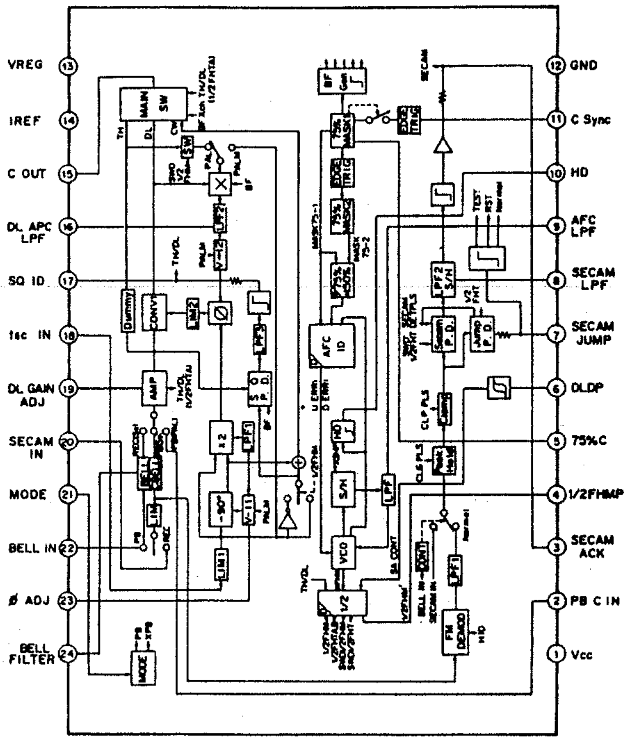
IC361 (VA-43) CXL1502


CCD3
ABP
VCO IN
PC OUT
VDD
CLK
GND
GND
GND
VSS
ADJY
YD
VDD
VSS
Y-YD
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
VCO
1/3 PULSE DIVIDER
PHASE COMPARATER
CLOCK DRIVER
ϕ1
ϕ2
AUTO BIAS CIRCUIT(P)
2H+D
OUTPUT CIRCUIT S/H CIRCUIT
BIAS CIRCUIT(A)
D
OUTPUT CIRCUIT S/H CIRCUIT
AUTO BIAS CIRCUIT(N)
D
OUTPUT CIRCUIT S/H CIRCUIT
BIAS CIRCUIT(B)
D
OUTPUT CIRCUIT S/H CIRCUIT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
VSS
CCDY
CCD2
ADJC
CCD1
N.C
VDD
VSS
N.C
ABN
TH
VGG A
VGG B
C-CD
VSS

IC362 (VA-43) CXA1201Q

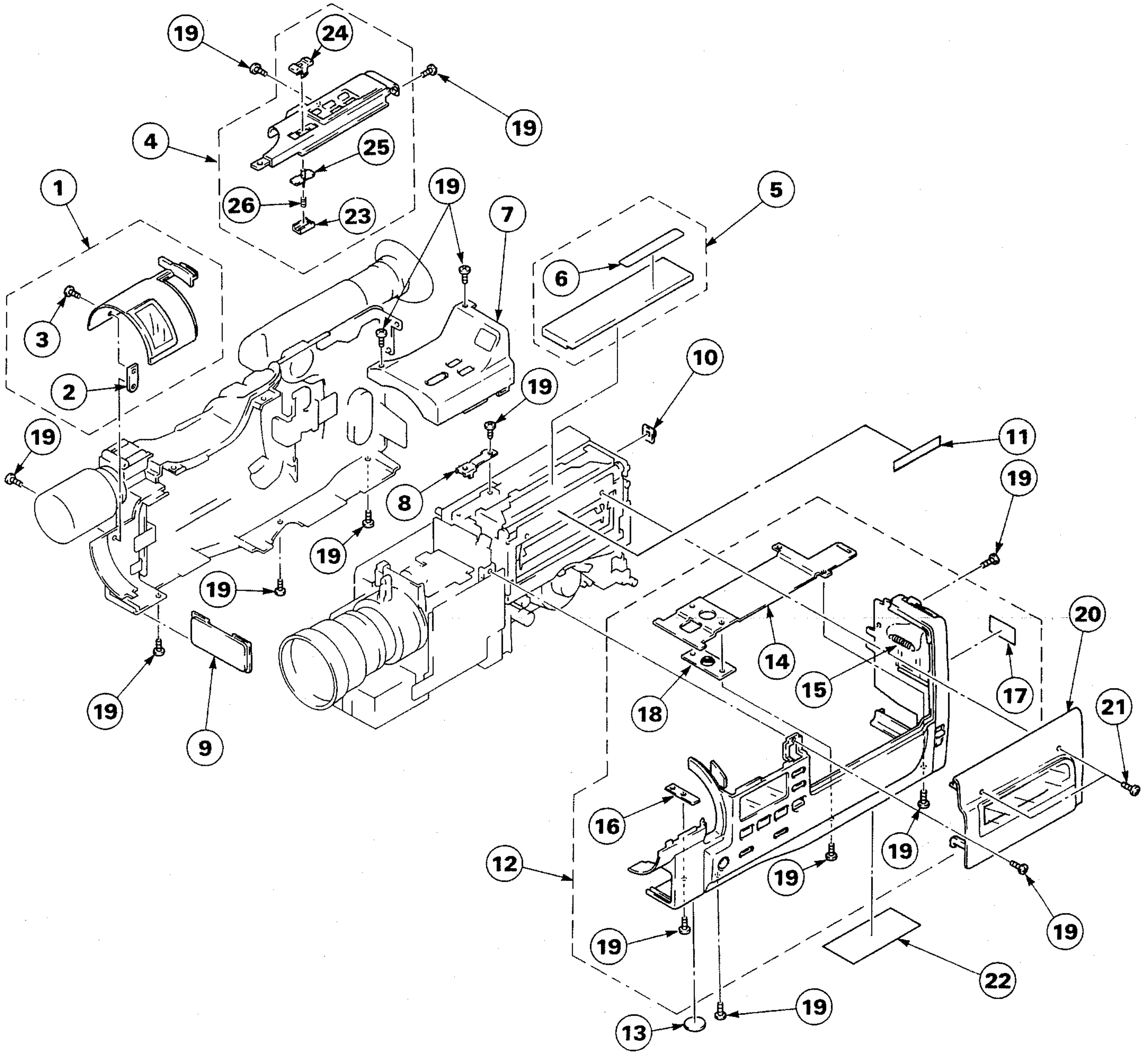

24
23
22
21
20
19
18
17
Vcc
SI
CS
CK
SO
WASK
ARHD
VOB
DUS DECODER
IN-1
25
CLAMP
CLAMP
CLAMP
CLAMP
SCE
YCA
AGC OFF
VDE
16
DOC PULSE
15
V REG 26
27 GND
SYNC OUT
14 SYNC
SYNC SEP
CLAMP
PULSE GEN
IN-2
28
13 NC
REG2.2V
NC 29
12 SS IN
AGC DET
CLAMP
REC VIDEO OUT
I REF 30
11 REC V
6dB
IN-3
31
10 CLP IN
Vcc 2
AGC TC 32
9
6CE
REC LEVEL
PB IN
PB LEVEL
RF M OUT
VIDEO OUT
1
2
3
4
5
6
7
8
JOB V
INV IN
GND 2

IC363 (VA-43) CXA1203M


VREG 13
IREF 14
C OUT 15
DL APC LPF 16
SQ ID 17
fsc IN 18
DL GAIN ADJ 19
SECAM IN 20
MODE 21
BELL IN 22
ϕ ADJ 23
BELL FILTER 24
12 GND
11 C Sync
10 HD
9 AFC LPF
8 SECAM LPF
7 SECAM JUMP
6 DLDP
5 75%C
4 1/2FHMP
3 SECAM ACK
2 PB C IN
1 Vcc
MAIN SW
TH
DL
CW
SW
PAL
PAL M
BF
LPF2
TH/DL
V-1/2
Dummy
CONV
LIM2
LPF3
AMP
S.O. P.D.
BELL
LIM
PB
REC
×2
LPF1
-90°
V-1/1
LIM1
MODE
PB
XPB
BF
Gain
75% MASK
EDGE TRIG
EDGE TRIG
75% MASK
MASK 75-1
MASK 75-2
75% 50%
AFC ID
U ERR
D ERR
HD
S/H
LPF
VCO
SA CONT
TH/DL
1/2
SECAM
TEST
RST
Normal
LPF2 S/H
1/2 FHT
Secam P.D.
Jump P.D.
CLP PLS
CLS PLS
Peak Hold
CONT
LPF1
Normal
BELL IN
SECAM IN
FM DEMOD
HD

SECTION 5
EXPLODED VIEWS AND SPARE PARTS LIST

VS 8000 ①


19
24
19
4
25
1
26
23
19
7
5
6
3
2
10
19
19
11
19
8
19
19
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14
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18
9
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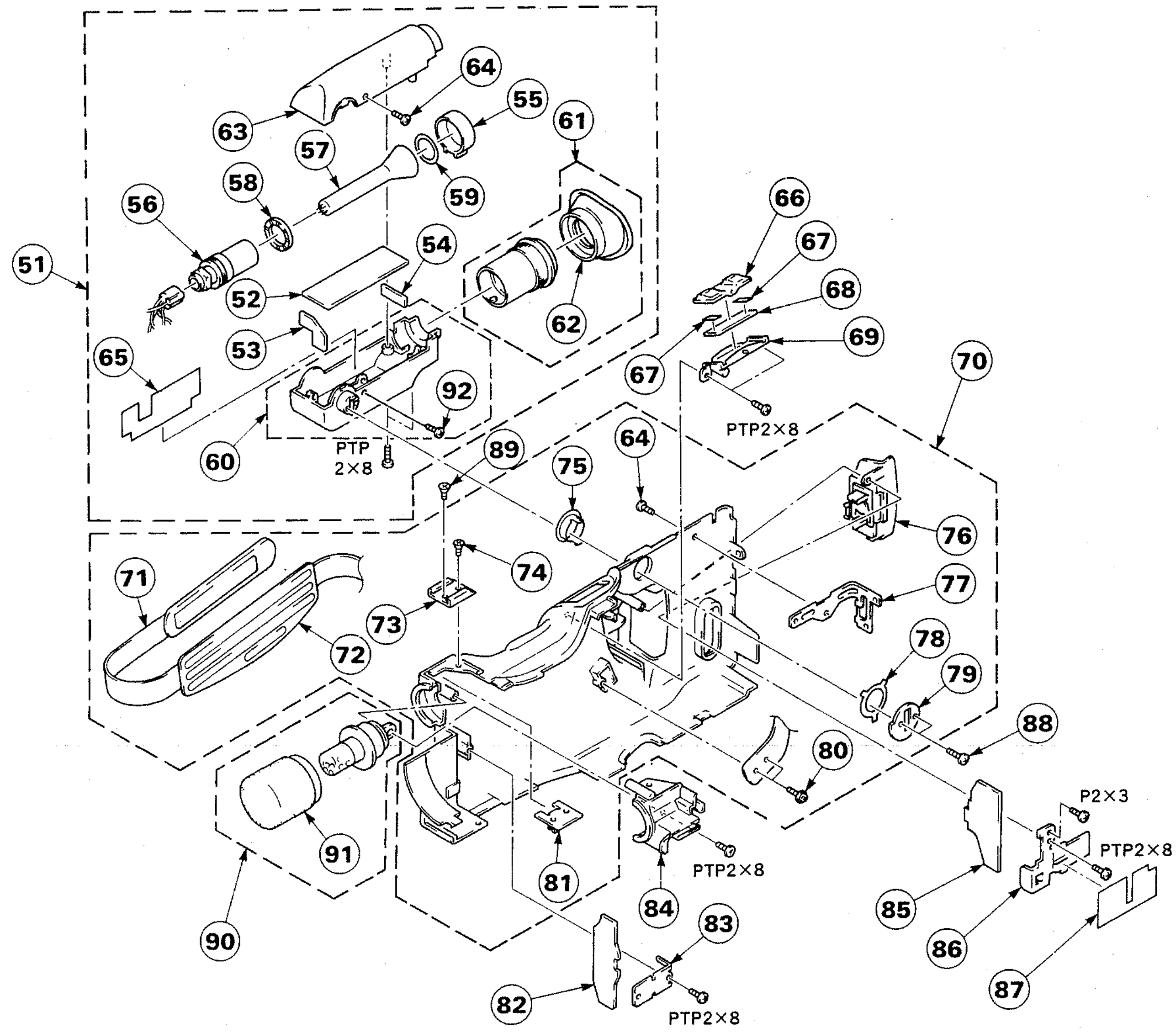
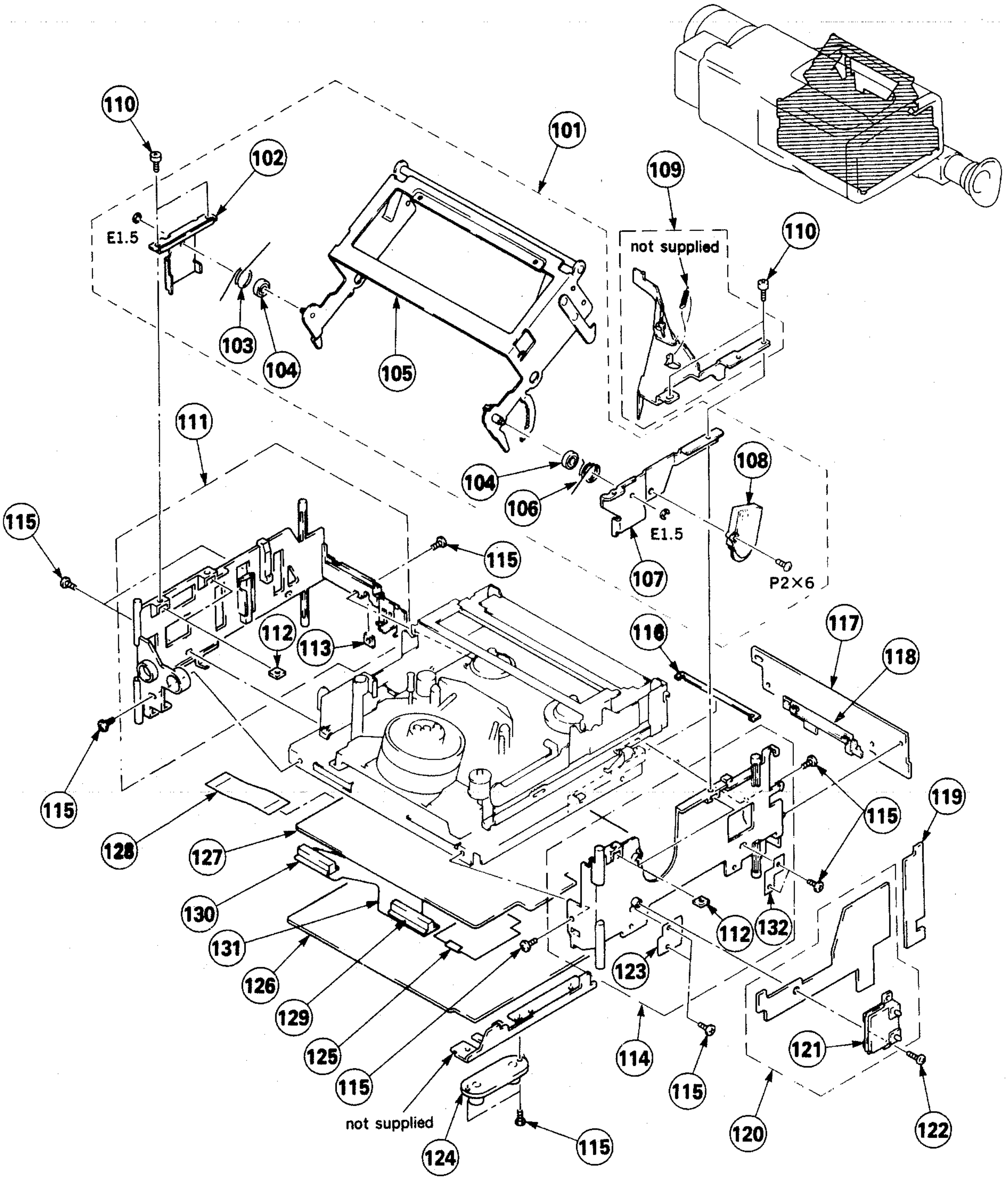
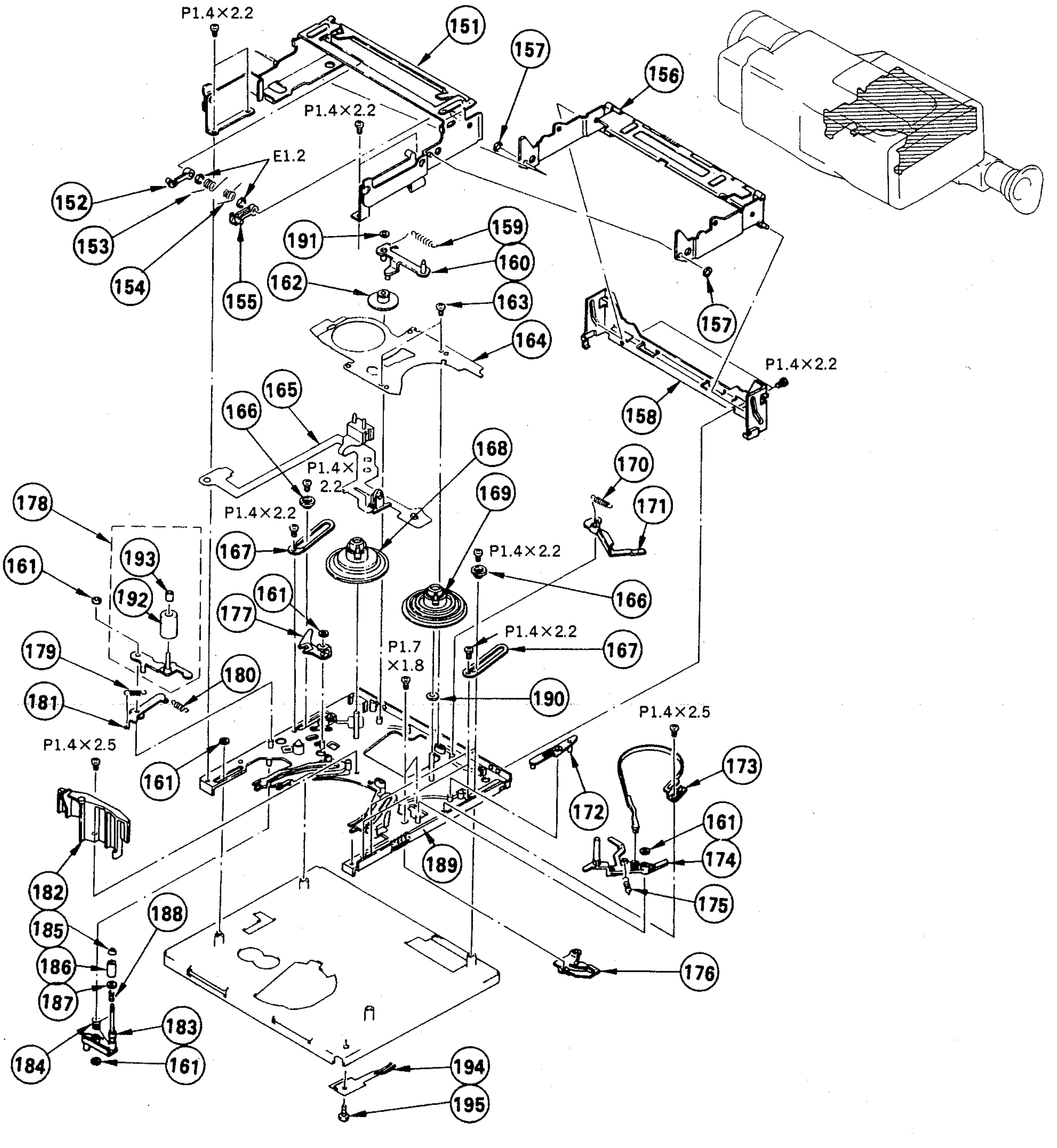
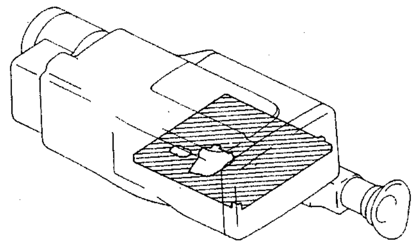
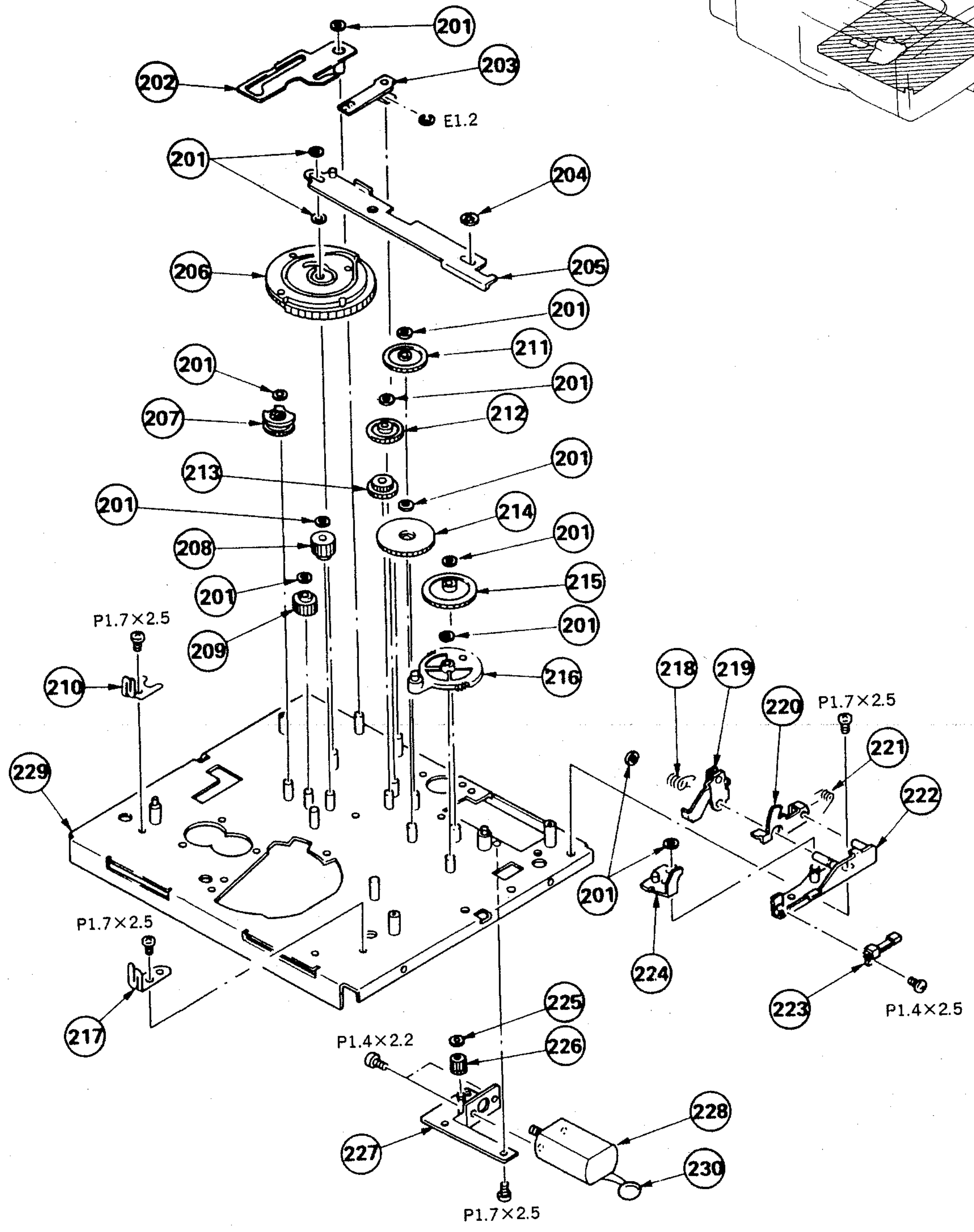
12
19
19
19
19
22
19
13

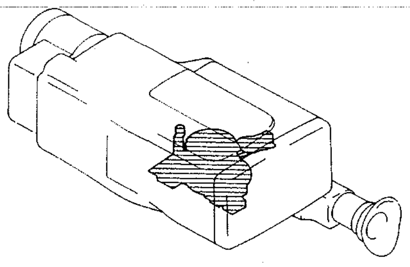

(64)
(55)
(61)
(63)
(57)
(58)
(59)
(56)
(66)
(51)
(54)
(67)
(52)
(62)
(68)
(53)
(69)
(65)
(92)
(67)
(70)
PTP2×8
PTP
2×8
(60)
(89)
(75)
(64)
(76)
(74)
(71)
(77)
(73)
(72)
(78)
(79)
(88)
(80)
P2×3
PTP2×8
(91)
(81)
(84)
PTP2×8
(85)
(86)
(90)
(83)
(87)
(82)
PTP2×8

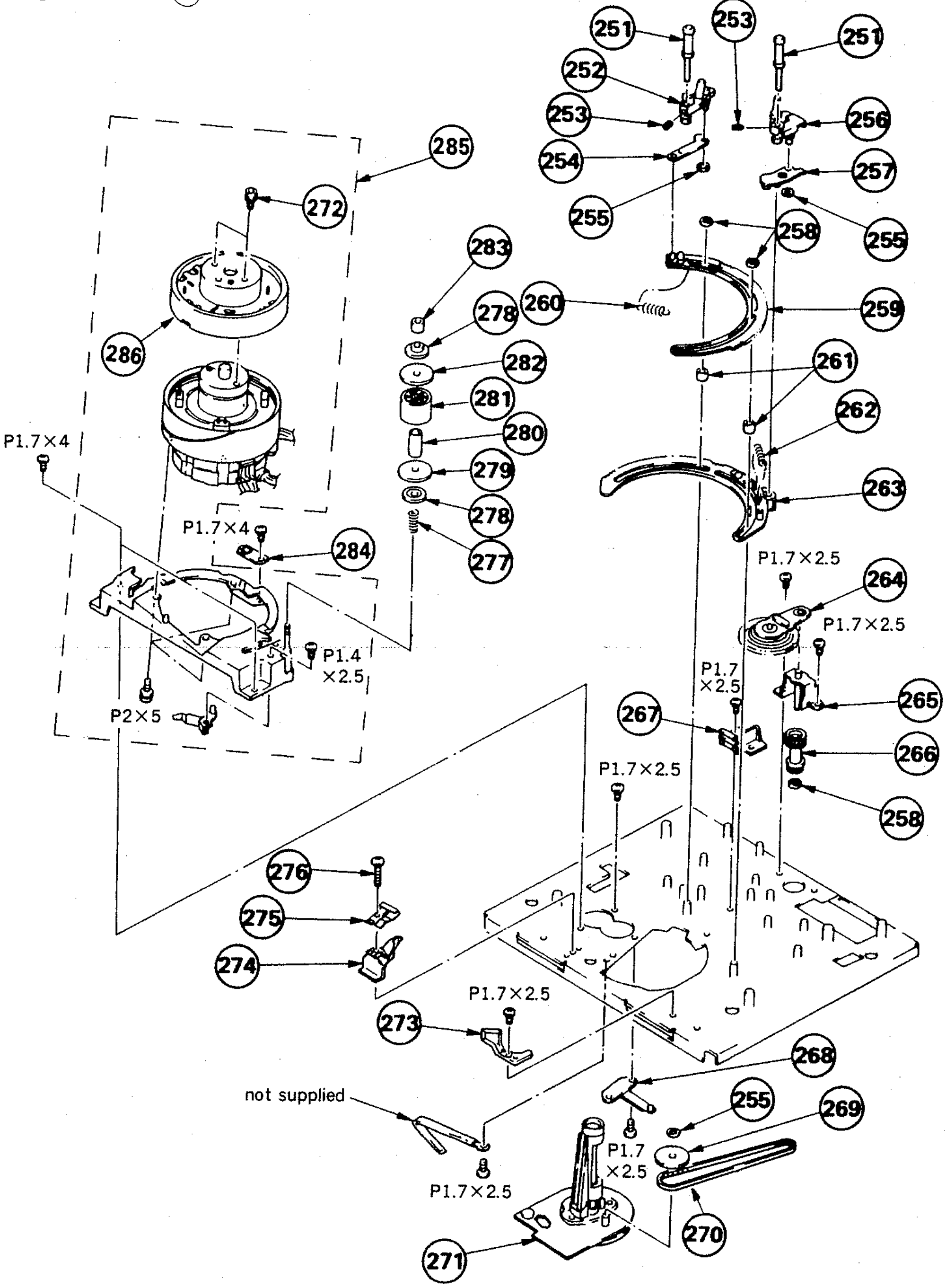

E1.5
not supplied
E1.5
P2×6
not supplied

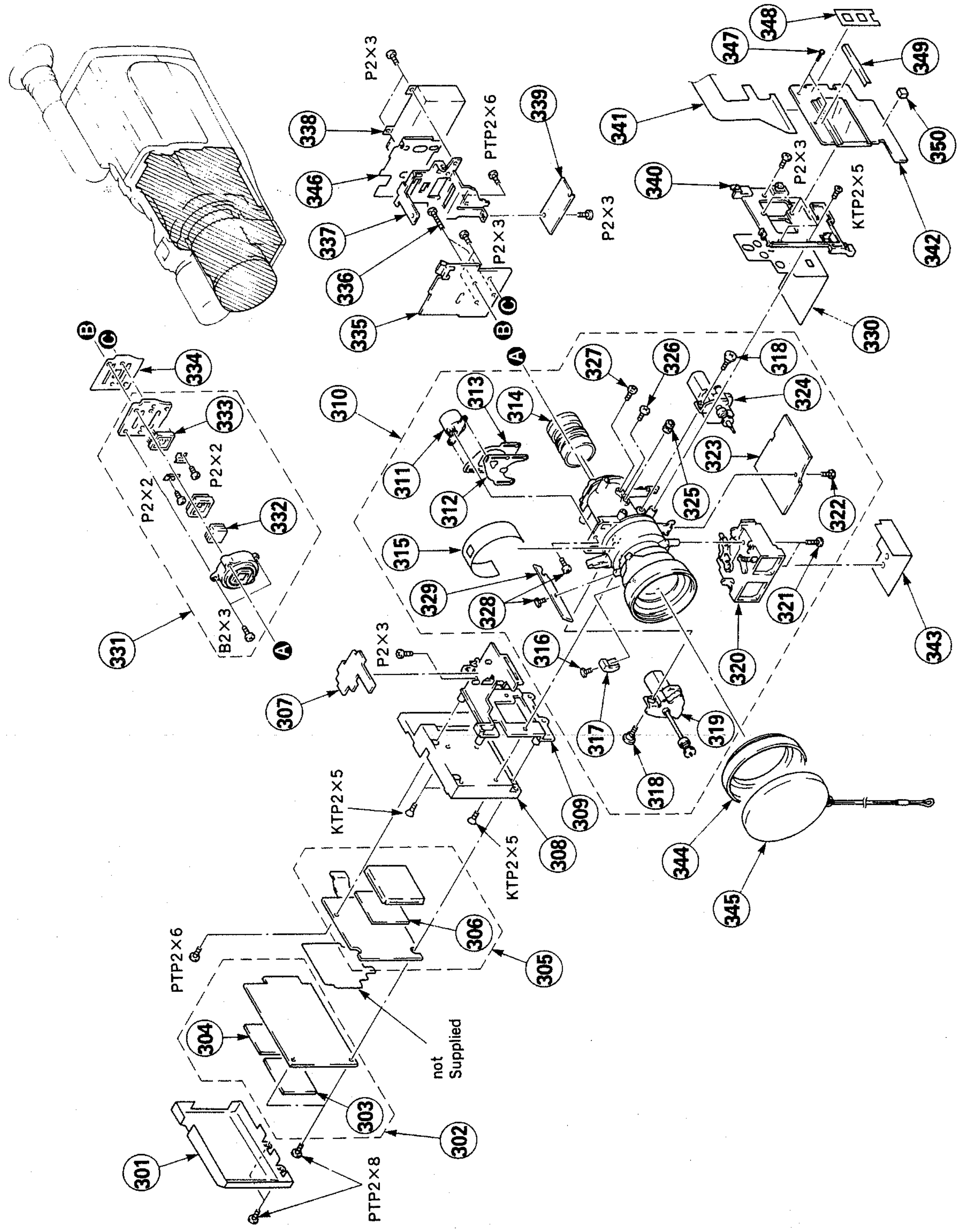

P1.4×2.2
P1.4×2.2
E1.2
P1.4×2.2
P1.4×2.2
P1.4×2.2
P1.4×2.2
P1.4×2.2
P1.7×1.8
P1.4×2.5
P1.4×2.5




E1.2
P1.7×2.5
P1.7×2.5
P1.7×2.5
P1.4×2.5
P1.4×2.2
P1.7×2.5




P1.7×4
P1.7×4
P1.7×2.5
P1.7×2.5
P1.4
×2.5
P1.7
×2.5
P2×5
P1.7×2.5
P1.7×2.5
not supplied
P1.7
×2.5
P1.7×2.5


P2×3
PTP2×6
P2×3
P2×3
P2×3
KTP2×5
P2×2
P2×2
B2×3
P2×3
KTP2×5
KTP2×5
PTP2×6
PTP2×8
not Supplied
A
B
C

GRUNDIG Ersatzteilliste
List of spare parts

CAM CORDER

(D) Btx *32700 #

3 / 90

VS 8000

(ERSETZT AUSGABE 12 / 89)

SACH-NR. / PART N0.:75987-525.00

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0001.000	1	75987-526.81		ABDECKUNG	COVER
0004.000	1	75987-526.82		ABDECKUNG	COVER
0005.000	1	75987-526.83		ABDECKUNG	COVER
0007.000	1	75987-526.84		ABDECKUNG	COVER
0008.000	1	75987-526.85		HALTER	HOLDER
0009.000	1	75987-526.86		FENSTER	WINDOW
0010.000	1	75987-526.87		TASTE	KEY
0012.000	1	75987-526.88		GEHAEUSETEIL KPL.	HOUSING PART
0015.000	1	75987-526.89		FEDER	SPRING
0020.000	1	75987-526.90		CASSETTENFACHDECKEL	CASSETTE COMPARTMENT LID
0023.000	1	75987-526..91		KAPPE	CAP
0024.000	1	75987-526.92		TASTE	KEY
0051.000	2	75987-527.86		SUCHERMONITOR KPL.	VIEWFINDER MONITOR
0056.000	2	75987-526.93		ABLENKEINHEIT	DEFLECTION UNIT
0057.000	2	75987-526.94		BILDROEHRE	PICTURE TUBE
0060.000	2	75987-526.95		BODEN	BOTTOM
0061.000	2	75987-526.96		HALTER	HOLDER
0062.000	2	75987-526.97		AUGENMUSCHEL	EYE CAP
0063.000	2	75987-526.98		ABDECKUNG	COVER
0066.000	2	75987-526.99		TASTE	KEY
0068.000	2	75987-527.00		ZOOM-PLATTE	ZOM-PLATE
0069.000	2	75987-527.01		PLATTE	PLATE
0070.000	2	75987-527.02		GEHAEUSETEIL KPL.	HOUSING PART
0071.000	2	75987-527.03		HALTERIEMEN	STRAP
0073.000	2	75987-527.04		HALTESCHUH	EVF SHOE
0076.000	2	75987-527.05		ABDECKUNG	COVER
0082.000	2	75987-527.06		DRUCKPLATTE	P.C. BOARD ASSY
0084.000	2	75987-527.07		MIKROFON-GEHAEUSE	MICROPHONE-HOUSING
0085.000	2	75987-527.08		START-STOP-PLATTE	START-STOP-PLATE
0090.000	2	75987-527.09		MIKROFON	MICROPHONE
0091.000	2	75987-527.10		WINDSCHUTZ	CORRECTION CAP
0101.000	3	75987-527.11		SCHACHT KPL.	COMPARTMENT CPL.
0103.000	3	75987-527.12		FEDER	SPRING
0106.000	3	75987-527.13		FEDER	SPRING
0109.000	3	75987-527.14		WINKEL	BRACKET
0111.000	3	75987-527.15		RAHMEN	FRAME
0114.000	3	75987-527.16		RAHMEN	FRAME
0117.000	3	75987-527.17		DRUCKPLATTE / FV-4P	P.C. BOARD ASSY / FV-4P
0118.000	3	75987-527.18		HALTER	HOLDER
0119.000	3	75987-527.19		DRUCKPLATTE / EJ-9P	P.C. BOARD ASSY / EJ-9P
0120.000	3	75987-527.20		DRUCKPLATTE / PA-24P	P.C. BOARD ASSY / PA-24P
0124.000	3	75987-527.21		KONTAKT	CONTACT
0126.000	3	75987-527.22		DRUCKPLATTE / VA-43	P.C. BOARD ASSY / VA-43
0127.000	3	75987-527.23		DRUCKPLATTE SS-93B	P.C. BOARD ASSY / SS-93B
0128.000	3	75987-527.24		FLEXIBLE LEITUNG	FLEXIBLE CABLE
0129.000	3	75987-527.25		STECKER	PLUG
0131.000	3	75987-527.26		FLEXIBLE LEITUNG	FLEXIBLE CABLE
0153.000	4	75987-527.27		SCHENKELFEDER	LEG SPRING
0154.000	4	75987-527.28		SCHENKELFEDER	LEG SPRING
0159.000	4	75987-527.29		ZUGFEDER	TENSION SPRING
0165.000	4	75987-527.30		DRUCKPLATTE / FP-53	P.C. BOARD ASSY / FP-53
0167.000	4	75987-527.31		BLATTFEDER	LEAF SPRING
0170.000	4	75987-527.32		ZUGFEDER	TENSION SPRING
0173.000	4	75987-527.33		BREMSBAND	BRAKE TAPE
0175.000	4	75987-527.34		ZUGFEDER	TENSION SPRING

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0178.000	4	75987-527.35		ROLLENHEBEL	ROLLER LEVER
0179.000	4	75987-527.36		ZUGFEDER	TENSION SPRING
0180.000	4	75987-527.40		ZUGFEDER	TENSION SPRING
0184.000	4	75987-527.41		DREHFEDER	TORSION SPRING
0188.000	4	75987-527.42		DRUCKFEDER	PRESSURE SPRING
0201.000	5	75987-527.43		SCHEIBE	WASHER
0204.000	5	75987-527.44		SCHEIBE	WASHER
0218.000	5	75987-527.45		FEDER	SPRING
0221.000	5	75987-527.46		SCHENKELFEDER	LEG SPRING
0223.000	5	75987-527.47		SCHALTER	SWITCH
0225.000	5	75987-527.48		SCHEIBE	WASHER
0226.000	5	75987-527.49		ZAHNRAD	GEAR WHEEL
0228.000	5	75987-527.50		MOTOR	MOTOR
0230.000	5	75987-527.51		KONDENSATOR 0,01MF	CAPACITOR
0251.000	6	75987-527.52		BANDFUEHRUNGSBOLZEN	TAPE GUIDE PIN
0255.000	6	75987-527.48		SCHEIBE	WASHER
0258.000	6	75987-527.43		SCHEIBE	WASHER
0260.000	6	75987-527.55		ZUGFEDER	TENSION SPRING
0262.000	6	75987-527.56		ZUGFEDER	TENSION SPRING
0264.000	6	75987-527.57		ZWISCHENRAD	IDLER WHEEL
0270.000	6	75987-527.58		RIEMEN	BELT
0271.000	6	75987-527.59		CAPSTAN MOTOR	CAPSTAN MOTOR
0275.000	6	75987-527.60		BLATTFEDER	LEAF SPRING
0277.000	6	75987-527.61		DRUCKFEDER	PRESSURE SPRING
0281.000	6	75987-527.62		FUEHRUNGSROLLE	GUIDE ROLLER
0284.000	6	75987-527.63		FEUCHTIGKEITSSENSOR	DEW SENSOR
0285.000	6	75987-527.64		BANDTROMMEL KPL.	TAPE DRUM
0286.000	6	75987-527.65		KOPFRAD	HEAD WHEEL
0302.000	7	75987-527.87		DRUCKPLATTE / VC-63P	P.C. BOARD ASSY / VC-639
0305.000	7	75987-527.66		DRUCKPLATTE / VC-62P	P.C. BOARD ASSY / VC-62P
0306.000	7	75987-527.67		DRUCKPLATTE / DT-73	P.C. BOARD ASSY / DT-73
0310.000	7	75987-527.68		OPTIK KPL.	OPTIC CPL.
0311.000	7	75987-527.69		IRIS-MOTOR	IRIS-MOTOR
0313.000	7	75987-527.70		BLENDE	PANEL
0315.000	7	75987-527.71		ABDECKUNG	COVER
0319.000	7	75987-527.72		FOCUS-MOTOR	FOCUS-MOTOR
0320.000	7	75987-527.73		AUTO-FOCUS	AUTO FOCUS
0323.000	7	75987-527.74		DRUCKPLATTE / AF	P.C. BOARD ASSY
0324.000	7	75987-527.75		ZOOM-MOTOR	ZOOM-MOTOR
0329.000	7	75987-527.76		DRUCKPLATTE / SW	P.C. BOARD ASSY / SW
0331.000	7	75987-527.77		CCD-EINHEIT	CCD-UNIT
0333.000	7	75987-527.78		IC ICX 027 BK-2	IC ICX 027 BK-2
0335.000	7	75987-527.79		DRUCKPLATTE / VC-61P	P.C. BOARD ASSY / VC-61P
0338.000	7	75987-527.80		DC-DC-WANDLER	DC-DC-CONVERTER
0339.000	7	75987-527.81		DRUCKPLATTE / DC-21P	P.C. BOARD ASSY / DC-21P
0341.000	7	75987-527.82		FELXIBLE LEITUNG	FLEXIBLE CABLE
0342.000	7	75987-527.83		DRUCKPLATTE / FC-25P	P.C. BOARD ASSY / FC-25P
0344.000	7	75987-527.84		SEITENLICHTBLENDE	SIDE LIGHT FILTER
0345.000	7	75987-527.85		LINSENABDECKUNG	LENS COVER
0347.000		75987-526.80		SCHRAUBEN/SIRI-SATZ	SCREW SET
				ZUBEHOER	ACCESSORY
		75987-527.88		NETZTEIL NA 8	MAINS PART NA 8
		75987-527.90		BATTERIE BP 8-1	BATTERY BP 8-1
		75987-527.89		MODULATOR M 8	MODULATOR M 8
		75987-527.91		ANTENNENSCHALTER AS8	ANTENNA SWITCH AS 8
		75987-527.92		BATTERIEKABEL PA 8	BATTERY CABLE PA 8
		75987-527.93		SCHULTERRIEMEN SH 8	SHOULDER BELT SH 8
		72010-506.31		BEDIEN.ANLEITUNG(F/D/E)	INSTRUCTION BOOK (F/B/E)
		72010-506.30		BEDIEN.ANLEITUNG /G	INSTRUCTION BOOK (G)
		72010-506.32		BEDIEN.ANLEITUNG(N/S/I)	INSTRUCTION BOOK (N/S/I)

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
	75987-525.55	VERZOEGERUNGSLTG.DL 360
	75987-526.74	DISPLAY ND 101
	75987-525.79	SENSOR SB 850
	75987-525.58	TRAFO T 901
	75987-525.80	THERMISTOR TH 901
	75987-526.79	BUCHSE DC OUT-MIC.
	75987-526.76	BUCHSE REMOTE
2X	75987-526.77	BUCHSE EXIT-MIC/KOPFH.
	75987-526.75	HALTER-BATTERIE
	75987-526.73	REGLERBLOCK / CP 901
C 907 ⚠	75987-521.51	CHIP KONDENS.4700PF
C 908 ⚠	75987-521.52	CHIP KONDENS.3
CT 101	75987-525.01	TRIMMER
CT 620	75987-525.01	TRIMMER
CV 360	75987-525.01	TRIMMER
CV 361	75987-526.72	TRIMMER
D 003	75987-458.27	DIODE MA 110
D 004	75987-525.88	DIODE DWA 010
D 050	75987-514.32	DIODE SB 05-05CP
D 051	75987-514.32	DIODE SB 05-05CP
D 101	75987-525.88	DIODE DWA 010
D 104 ⚠	75987-525.87	DIODE SB 01-05 CP
D 302	75987-525.89	DIODE GL 452 S
D 303	75987-432.39	PHOT SENSER
D 304	75987-432.39	PHOT SENSER
D 361	75986-190.00	DIODE 1 S 2837
D 362	75987-525.86	DIODE 1 SS 226
D 363	75987-525.86	DIODE 1 SS 226
D 364	75986-190.00	DIODE 1 S 2837
D 365	75987-525.86	DIODE 1 SS 226
D 367	75987-525.86	DIODE 1 SS 226
D 368	75987-525.85	DIODE RD 9.1 M-B 1
D 372	75986-190.00	DIODE 1 S 2837
D 399	75987-525.84	DIODE RD 2.7 M-B2
D 551	75987-525.85	DIODE RD 9.1 M-B 1
D 600	75987-442.25	DIODE MA 141 WA
D 601	75987-458.27	DIODE MA 110
D 623	75986-190.00	DIODE 1 S 2837
D 624	75986-190.00	DIODE 1 S 2837
D 625	75987-525.81	DIODE 1 T 32-2
D 626	75986-190.00	DIODE 1 S 2837
D 850	75978-565.10	DIODE 1 S 2835
D 903	75987-356.22	DIODE MA 152 WA (M0)
D 950	75987-525.90	DIODE GL 1 HD 51
D 955	75987-525.90	DIODE GL 1 HD 51
D 990	75987-525.87	DIODE SB 01-05 CP
FL 361	75987-525.77	FILTER 5.17MHZ
FL 362	75987-525.12	FILTER 4.43MHZ
FL 363	75987-525.24	FILTER 5.89MHZ
FL 365	75987-525.13	FILTER 4.43MHZ
FL 580	75987-525.11	FILTER 1.5MHZ
FL 701	75987-525.16	FILTER
FL 702	75987-525.17	FILTER
FL 704	75987-525.14	FILTER
FL 706	75987-525.56	FILTER
FL 707	75987-525.15	FILTER

ÄNDERUNGEN VORBEHALTEN

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
IC 001	75987-526.41	IC UPD 78112 GF-540-38 E
IC 002	75987-246.11	IC UPC 358 G 2
IC 003 ⚠	75987-526.47	IC LB 1631 M
IC 004	75987-526.29	IC CXA 1109 M
IC 005	75987-526.50	IC S 81350 AG-REG
IC 006	75987-526.37	IC CX 20115 A
IC 007	75987-526.48	IC CXA 1127 M
IC 101	75987-526.40	IC UPD 75308 GF-350-389
IC 102	75987-526.52	IC S 8054 ARL-S
IC 200	75987-526.39	IC UPD 7507 HG 552-22
IC 250	75987-526.43	IC CXA 1204 Q
IC 301	75987-526.26	IC CXA 1202 R
IC 360	75987-526.28	IC CXA 1200 BQ
IC 361	75987-526.30	IC CXL 1502 M
IC 362	75987-526.27	IC CXA 1201 Q
IC 363	75987-526.45	IC CXA 1203 N
IC 364	75987-526.46	IC NJM 2233 AM
IC 365	75987-526.46	IC NJM 2233 AM
IC 366	75987-469.22	IC UPC 393 G 2
IC 367	75987-526.42	IC TC 40 H 008 F
IC 368	75987-526.38	IC UPD 6145 G-601
IC 550	75987-526.49	IC LA 7293 M
IC 580	75987-526.24	IC SBX 1505-21
IC 600	75987-526.32	IC ICX 027 BK-2
IC 620	75987-526.33	IC RC 3414 M
IC 621	75987-526.31	IC CXD 1159 Q
IC 701	75987-526.25	IC CXA 1072 R
IC 850	75987-526.35	IC MC 34182 MR
IC 851	75987-246.12	IC UPD 4066 BG
IC 852	75987-526.34	IC MC 146805 F2FPSC82533F
IC 853	75987-469.22	IC UPC 393 G 2
IC 901	75987-526.44	IC AN 2512 S
L 001	75987-525.32	SPULE 10UH
L 002	75987-525.32	SPULE 10UH
L 050	75987-525.57	SPULE 700UH
L 051	75987-525.57	SPULE 700UH
L 052	75987-525.44	SPULE 100UH
L 053	75987-525.39	SPULE 47UH
L 101	75987-525.27	SPULE 1UH
L 200	75987-525.29	SPULE 4,7UH
L 250	75987-525.21	SPULE 100UH
L 251	75987-525.23	SPULE 330UH
L 301	75987-525.19	SPULE 10UH
L 302	75987-525.22	SPULE 220UH
L 303	75987-525.50	SPULE 10UH
L 307	75987-525.53	SPULE 220UH
L 308	75987-525.53	SPULE 220UH
L 362	75987-525.51	SPULE 47UH
L 363	75987-525.51	SPULE 47UH
L 364	75987-525.50	SPULE 10UH
L 365	75987-525.51	SPULE 47UH
L 366	75987-525.33	SPULE 15UH
L 367	75987-525.36	SPULE 22UH
L 368	75987-525.43	SPULE 100UH
L 369	75987-525.43	SPULE 100UH
L 370	75987-525.42	SPULE 82UH
L 371	75987-525.43	SPULE 100UH
L 372	75987-525.43	SPULE 100UH
L 373	75987-525.46	SPULE 150UH
L 374	75987-525.31	SPULE 8.2UH
L 375	75987-525.23	SPULE 330UH

ALTERATIONS RESERVED

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
L 376	75987-525.45	SPULE 120UH
L 377	75987-525.37	SPULE 33UH
L 379	75987-525.47	SPULE 180UH
L 380	75987-525.47	SPULE 180UH
L 381	75987-525.23	SPULE 330UH
L 382	75987-525.25	SPULE 820UH
L 383	75987-525.23	SPULE 330UH
L 384	75987-525.43	SPULE 100UH
L 385	75987-525.32	SPULE 10UH
L 386	75987-525.40	SPULE 56UH
L 387	75987-525.38	SPULE 39UH
L 391	75987-525.40	SPULE 56UH
L 392	75987-525.35	SPULE 18UH
L 393	75987-525.37	SPULE 33UH
L 395	75987-525.38	SPULE 39UH
L 396	75987-525.41	SPULE 68UH
L 525	75987-525.43	SPULE 100UH
L 580	75987-525.20	SPULE 47UH
L 600	75987-525.52	SPULE 100UH
L 622	75987-525.50	SPULE 10UH
L 623	75987-525.50	SPULE 10UH
L 624	75987-525.54	SPULE 330UH
L 625	75987-525.52	SPULE 100UH
L 626	75987-525.28	SPULE 10UH
L 628	75987-525.27	SPULE 1UH
L 629	75987-525.49	SPULE 1 UH
L 630	75987-525.26	SPULE 0,1UH
L 631	75987-525.26	SPULE 0,1UH
L 701	75987-525.51	SPULE 47UH
L 702	75987-525.51	SPULE 47UH
L 703	75987-525.28	SPULE 10UH
L 704	75987-525.47	SPULE 180UH
L 850	75987-525.51	SPULE 47UH
L 901	75987-525.18	SPULE 100 UH
L 902	75987-525.30	SPULE 6,8 UH
L 903	75987-525.59	SPULE
L 990	75987-525.49	SPULE 1 UH
L 991	75987-525.49	SPULE 1 UH
L 992	75987-525.49	SPULE 1 UH
PH 001	75987-526.15	FOTO-TRANS.PT 480 fi
PH 002	75987-526.15	FOTO-TRANS.PT 480 FI
PS 990	75987-525.61	SICHERUNG PRF1600
PS 991	75987-525.61	SICHERUNG PRF1600
Q 001	75987-526.09	TRANS.2 SB 926
Q 002	75987-526.00	TRANS.2 SC 4177
Q 005	75987-511.99	TRANS.FMW 1
Q 006	75987-511.99	TRANS.FMW 1
Q 007	75987-526.19	TRANS.DTA 143 EU
Q 008	75987-525.99	TRANS.2 SA 1611 M 6
Q 051	75987-526.06	TRANS.2 SB 1121
Q 052	75987-526.06	TRANS.2 SB 1121
Q 053	75987-512.10	TRANS.-WIDERST.FMG 2
Q 055	75987-459.47	TRANS.-WIDERST.UN 5213
Q 070	75987-526.23	TRANS.IMT 1 US
Q 071	75987-512.10	TRANS.-WIDERST.FMG 2
Q 073	75987-526.19	TRANS.DTA 143 EU
Q 074	75987-459.47	TRANS.-WIDERST.UN 5213
Q 075	75987-459.49	TRANS.-WIDERST.UN 5113
Q 076	75987-459.47	TRANS.-WIDERST.UN 5213
Q 078	75987-459.49	TRANS.-WIDERST.UN 5113
Q 079	75987-526.20	TRANS.DTA 124 EU
Q 080	75987-526.06	TRANS.2 SB 1121
Q 081	75987-526.06	TRANS.2 SB 1121
Q 090	75987-525.99	TRANS.2 SA 1611 M 6
Q 101	75987-434.50	TRANS.2 SA 1576 QR
Q 102	75987-525.97	TRANS.2 SK 94-X2/X3
Q 103	75987-512.76	TRANS.-WIDERST.FMS 1
Q 104	75987-526.17	TRANS.DTC 144 WU
Q 105	75987-526.16	TRANS.DTA 144 EU
Q 106	75987-434.54	TRANS.2 SC 4081 QR
Q 107	75987-526.23	TRANS.IMT 1 US
Q 108	75987-434.50	TRANS.2 SA 1576 QR
Q 109	75987-434.54	TRANS.2 SC 4081 QR
Q 110	75987-525.97	TRANS.2 SK 94-X2/X3
Q 204	75987-459.47	TRANS.-WIDERST.UN 5213
Q 205	75987-459.47	TRANS.-WIDERST.UN 5213
Q 206	75987-459.47	TRANS.-WIDERST.UN 5213
Q 250	75987-434.50	TRANS.2 SA 1576 QR
Q 251	75987-434.54	TRANS.2 SC 4081 QR
Q 252	75987-434.50	TRANS.2 SA 1576 QR
Q 253	75987-525.97	TRANS.2 SK 94-X2/X3
Q 254	75987-526.18	TRANS.DTC 144 EU
Q 302	75987-526.01	TRANS.2 SA 1175 HFE
Q 303	75987-526.03	TRANS.2 SA 1162
Q 304	75987-459.49	TRANS.-WIDERST.UN 5113
Q 305	75987-459.49	TRANS.-WIDERST.UN 5113
Q 307	75987-459.47	TRANS.-WIDERST.UN 5213
Q 317	75987-526.00	TRANS.2 SC 4177
Q 318	75987-526.00	TRANS.2 SC 4177
Q 319	75987-459.49	TRANS.-WIDERST.UN 5113
Q 320	75987-526.00	TRANS.2 SC 4177
Q 361	75987-525.92	TRANS.2 SB 798
Q 362	75987-434.50	TRANS.2 SA 1576 QR
Q 363	75987-434.50	TRANS.2 SA 1576 QR
Q 364	75987-434.50	TRANS.2 SA 1576 QR
Q 365	75987-434.54	TRANS.2 SC 4081 QR
Q 366	75987-434.54	TRANS.2 SC 4081 QR
Q 367	75987-434.50	TRANS.2 SA 1576 QR
Q 368	75987-434.50	TRANS.2 SA 1576 QR
Q 369	75987-434.54	TRANS.2 SC 4081 QR
Q 370	75987-434.54	TRANS.2 SC 4081 QR
Q 371	75987-434.54	TRANS.2 SC 4081 QR
Q 372	75987-434.54	TRANS.2 SC 4081 QR
Q 373	75987-434.54	TRANS.2 SC 4081 QR
Q 374	75987-434.54	TRANS.2 SC 4081 QR
Q 375	75987-434.54	TRANS.2 SC 4081 QR
Q 376	75987-434.54	TRANS.2 SC 4081 QR
Q 377	75987-434.54	TRANS.2 SC 4081 QR
Q 378	75987-526.16	TRANS.DTA 144 EU
Q 379	75987-434.54	TRANS.2 SC 4081 QR
Q 380	75987-525.92	TRANS.2 SB 798
Q 381	75987-434.54	TRANS.2 SC 4081 QR
Q 382	75987-526.17	TRANS.DTC 144 WU
Q 383	75987-434.54	TRANS.2 SC 4081 QR
Q 384	75987-434.50	TRANS.2 SA 1576 QR
Q 385	75987-434.54	TRANS.2 SC 4081 QR
Q 386	75987-434.54	TRANS.2 SC 4081 QR
Q 387	75987-434.50	TRANS.2 SA 1576 QR
Q 388	75987-525.94	TRANS.2 SC 2223 F 13
Q 389	75987-434.54	TRANS.2 SC 4081 QR
Q 390	75987-434.54	TRANS.2 SC 4081 QR
Q 391	75987-434.54	TRANS.2 SC 4081 QR
Q 392	75987-434.54	TRANS.2 SC 4081 QR
Q 393	75987-434.54	TRANS.2 SC 4081 QR

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG Ⓓ DESCRIPTION (GB)
Q 394	75987-434.50	TRANS.2 SA 1576 QR
Q 395	75987-526.16	TRANS.DTA 144 EU
Q 396	75987-526.14	TRANS.DTC 114 TU
Q 397	75987-526.18	TRANS.DTC 144 EU
Q 398	75987-526.18	TRANS.DTC 144 EU
Q 399	75987-525.94	TRANS.2 SC 2223 F 13
Q 400	75987-525.94	TRANS.2 SC 2223 F 13
Q 402	75987-526.03	TRANS.2 SA 1162
Q 403	75987-526.03	TRANS.2 SA 1162
Q 404	75987-526.03	TRANS.2 SA 1162
Q 405	75987-526.18	TRANS.DTC 144 EU
Q 406	75987-525.94	TRANS.2 SC 2223 F 13
Q 407	75987-526.20	TRANS.DTA 124 EU
Q 408	75987-525.94	TRANS.2 SC 2223 F 13
Q 409	75987-525.94	TRANS.2 SC 2223 F 13
Q 410	75987-434.54	TRANS.2 SC 4081 QR
Q 411	75987-434.54	TRANS.2 SC 4081 QR
Q 412	75987-434.54	TRANS.2 SC 4081 QR
Q 413	75987-526.16	TRANS.DTA 144 EU
Q 414	75987-525.94	TRANS.2 SC 2223 F 13
Q 415	75987-526.03	TRANS.2 SA 1162
Q 416	75987-526.21	TRANS.DTC 124 EU
Q 417	75987-526.21	TRANS.DTC 124 EU
Q 418	75987-526.20	TRANS.DTA 124 EU
Q 420	75987-526.18	TRANS.DTC 144 EU
Q 421	75987-434.54	TRANS.2 SC 4081 QR
Q 423	75987-526.05	TRANS.XN 1216
Q 424	75987-526.18	TRANS.DTC 144 EU
Q 425	75987-434.54	TRANS.2 SC 4081 QR
Q 426	75987-434.54	TRANS.2 SC 4081 QR
Q 427	75987-434.50	TRANS.2 SA 1576 QR
Q 430	75987-526.18	TRANS.DTC 144 EU
Q 432	75987-526.05	TRANS.XN 1216
Q 433	75987-512.04	TRANS.-WIDERST.IMD 2
Q 434	75987-480.69	TRANS.-WIDERST.XN 4501
Q 435	75987-526.20	TRANS.DTA 124 EU
Q 436	75987-526.21	TRANS.DTC 124 EU
Q 437	75987-434.54	TRANS.2 SC 4081 QR
Q 551	75987-434.54	TRANS.2 SC 4081 QR
Q 552	75987-434.54	TRANS.2 SC 4081 QR
Q 580	75987-434.54	TRANS.2 SC 4081 QR
Q 581	75987-434.54	TRANS.2 SC 4081 QR
Q 582	75987-434.54	TRANS.2 SC 4081 QR
Q 600	75987-525.95	TRANS.2 SK 300-3
Q 601	75987-526.05	TRANS.XN 1216
Q 602	75987-434.54	TRANS.2 SC 4081 QR
Q 620	75987-434.54	TRANS.2 SC 4081 QR
Q 621	75987-434.50	TRANS.2 SA 1576 QR
Q 622	75987-434.54	TRANS.2 SC 4081 QR
Q 623	75987-434.50	TRANS.2 SA 1576 QR
Q 624	75987-434.50	TRANS.2 SA 1576 QR
Q 625	75987-434.54	TRANS.2 SC 4081 QR
Q 626	75987-459.60	TRANS.-WIDERST.XN 1213
Q 627	75987-434.54	TRANS.2 SC 4081 QR
Q 628	75987-434.50	TRANS.2 SA 1576 QR
Q 629	75987-526.10	TRANS.2 SC 3646
Q 630	75987-526.11	TRANS.2 SA 1416
Q 631	75987-434.54	TRANS.2 SC 4081 QR
Q 632	75987-434.50	TRANS.2 SA 1576 QR
Q 633	75987-434.50	TRANS.2 SA 1576 QR
Q 634	75987-525.91	TRANS.2 SC 1623
Q 701	75987-434.50	TRANS.2 SA 1576 QR
Q 702	75987-434.54	TRANS.2 SC 4081 QR
Q 705	75987-434.50	TRANS.2 SA 1576 QR
Q 706	75987-434.54	TRANS.2 SC 4081 QR
Q 707	75987-434.50	TRANS.2 SA 1576 QR
Q 708	75987-434.54	TRANS.2 SC 4081 QR
Q 709	75987-512.79	TRANS.XN 6401

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG Ⓓ DESCRIPTION (GB)
Q 710	75987-434.50	TRANS.2 SA 1576 QR
Q 711	75987-434.54	TRANS.2 SC 4081 QR
Q 712	75987-434.54	TRANS.2 SC 4081 QR
Q 850	75987-460.21	TRANS.-WIDERST.XN 1113
Q 851	75987-460.21	TRANS.-WIDERST.XN 1113
Q 852	75987-526.08	TRANS.2 SA 1341
Q 855	75987-459.60	TRANS.-WIDERST.XN 1213
Q 856	75987-459.60	TRANS.-WIDERST.XN 1213
Q 868	75987-521.53	TRANS.2 SC 3395
Q 869	75987-459.60	TRANS.-WIDERST.XN 1213
Q 903	75987-525.96	TRANS.2 SD 1615 GL
Q 904	75987-526.04	TRANS.2 SA 1163 L
RV 001	75987-525.09	ESTR.47 KOHM
RV 002	75987-525.10	ESTR.100 KOHM
RV 250	75987-525.09	ESTR.47 KOHM
RV 301	75987-525.09	ESTR.47 KOHM
RV 302	75987-525.09	ESTR.47 KOHM
RV 360	75987-525.04	ESTR.1 KOHM
RV 361	75987-525.07	ESTR.10 KOHM
RV 362	75987-525.09	ESTR.47 KOHM
RV 363	75987-525.05	ESTR.2.2 KOHM
RV 364	75987-525.05	ESTR.2.2 KOHM
RV 365	75987-525.06	ESTR. 4,7 KOHM
RV 366	75987-525.04	ESTR.1 KOHM
RV 367	75987-525.05	ESTR.2.2 KOHM
RV 368	75987-525.07	ESTR.10 KOHM
RV 369	75987-525.06	ESTR. 4,7 KOHM
RV 372	75987-525.06	ESTR. 4,7 KOHM
RV 373	75987-525.09	ESTR.47 KOHM
RV 374	75987-525.03	ESTR.470
RV 600	75987-525.09	ESTR.47 KOHM
RV 620	75987-525.09	ESTR.47 KOHM
RV 621	75987-525.06	ESTR. 4,7 KOHM
RV 622	75987-525.06	ESTR. 4,7 KOHM
RV 701	75987-525.09	ESTR.47 KOHM
RV 705	75987-525.09	ESTR.47 KOHM
RV 706	75987-525.09	ESTR.47 KOHM
RV 707	75987-525.09	ESTR.47 KOHM
RV 708	75987-525.09	ESTR.47 KOHM
RV 709	75987-525.09	ESTR.47 KOHM
RV 710	75987-525.09	ESTR.47 KOHM
RV 711	75987-525.09	ESTR.47 KOHM
RV 712	75987-525.09	ESTR.47 KOHM
RV 713	75987-525.09	ESTR.47 KOHM
RV 714	75987-525.09	ESTR.47 KOHM
RV 715	75987-525.09	ESTR.47 KOHM
RV 716	75987-525.09	ESTR.47 KOHM
RV 717	75987-525.09	ESTR.47 KOHM
RV 718	75987-525.09	ESTR.47 KOHM
RV 719	75987-525.09	ESTR.47 KOHM
RV 720	75987-525.09	ESTR.47 KOHM
RV 721	75987-525.09	ESTR.47 KOHM
RV 722	75987-525.09	ESTR.47 KOHM
RV 724	75987-525.05	ESTR.2.2 KOHM
RV 725	75987-525.08	ESTR.22 KOHM
RV 726	75987-525.07	ESTR.10 KOHM
RV 850	75987-525.07	ESTR.10 KOHM
RV 901	75987-525.02	ESTR.4,7 MOHM
S 101	75987-525.69	SCHALTER TITLE 1
S 102	75987-525.69	SCHALTER TITLE 2

SECTION 1
CAMERA BLOCK ADJUSTMENT

See the adjusting part location diagram from on page 18 for the adjustment.

For GRUNDIG Service Jigs please refer to page S 3 and S 4 from this manual.

PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

1-1. LIST OF SERVICING JIGS

● Oscilloscope ● AC pack ● Adjust screw driver ● L-Shaped wrench ● Stop watch ● Color monitor ● Vectorscope

Ref. No.	Name	Part No.	Use
J-1	Filter (C22)	J-6080-829-A	Automatic white balance check
	Filter (for fine weather)	J-6080-058-A	Pre-white balance adjustment (2)
J-2	ND filter 0.4	J-6080-806-A	IRIS set adjustment, LLA adjustment
	ND filter 0.1	J-6080-807-A	IRIS set adjustment, LLA adjustment
	ND filter 1.0	J-6080-808-A	MAX. gain adjustment, LLA adjustment (use 2 pcs)
J-3	Pattern box PTB-500 * 1	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Flat extension cable (15P)	J-6082-019-A	Use 1 pce
J-6	Extension cable (7P)	J-6080-917-A	Use 1 pce
	Extension cable (4P)	J-6082-042-A	Use 1 pce
	Extension cable (7P)	J-6080-886-A	Use 1 pce
	Extension cable K (2P)	J-6080-873-A	Use 1 pce
	Extension cable (3P)	J-6082-041-A	Use 1 pce
	Extension cable (5P)	J-6082-043-A	Use 1 pce
J-7	Lens fixing jig	J-6080-894-A	
J-8	Siemens-star	J-6080-875-A	Flange back adjustment
J-9	Sign chart	J-6080-876-A	

* 1 PTB-100 (J-6020-490-A) can also be used.

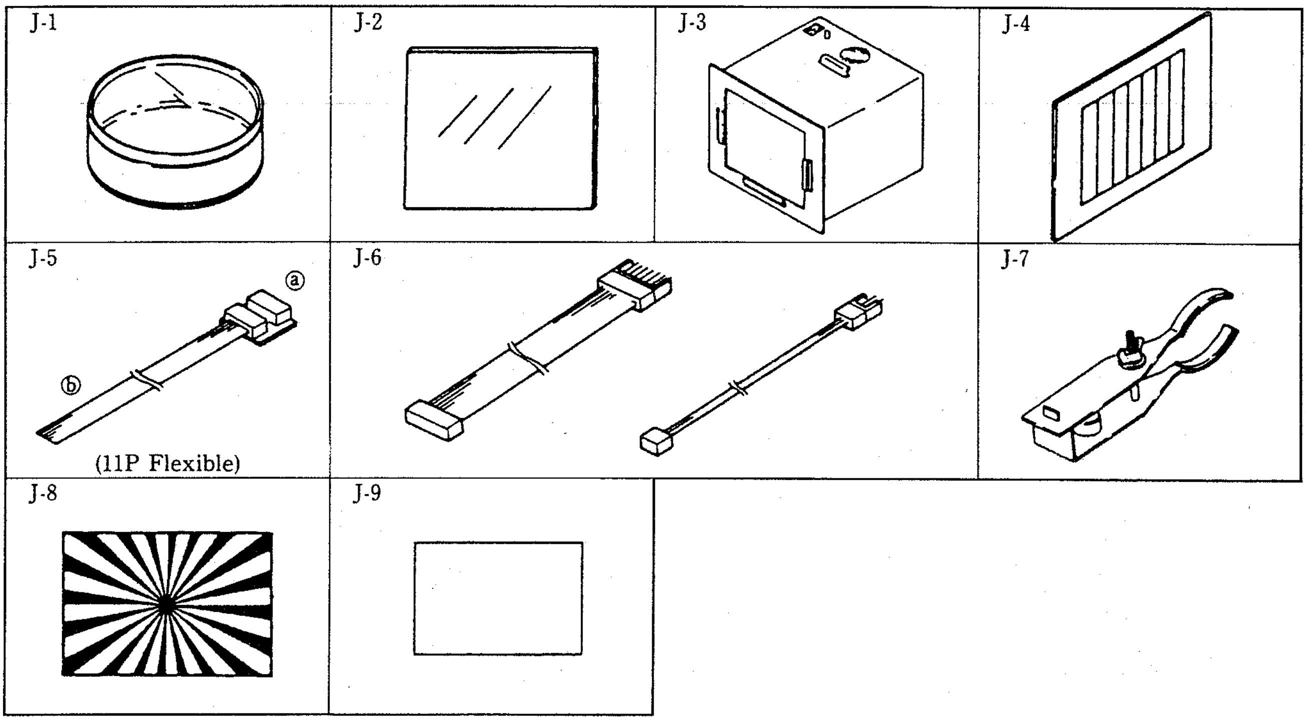


Fig. 1-1.

1-2. PREPARATIONS

Note : For more details regarding how to remove the cover and individual boards, refer to the Service Manual "1 Disassembly" of main unit.

1) Remove the camera cover, VTR panel and cabinets (left and right.)
2) Separate the camera unit from the video unit.
3) Open the camera board and fix the camera fixing jig by referring to the Service Manual, Main Unin, "2 Disassembly and 2-5. Removal of VC-61P board to VC-63P board" (Refer to Fig. 1-2).
4) Since the video block should be connected for the adjustment and checking, connect the extension cable as shown in Fig. 1-3.

Note 1 : In this case, EVF (Electric View Finder) should also be connected to VA-43 board CN360.

Note 2 : When the oscilloscope is used for the measurement and unless specified otherwise, EXT TRIG terminal and VC-63P terminal CN705 ⑧ pin (ID) should be connected for the synchronization.

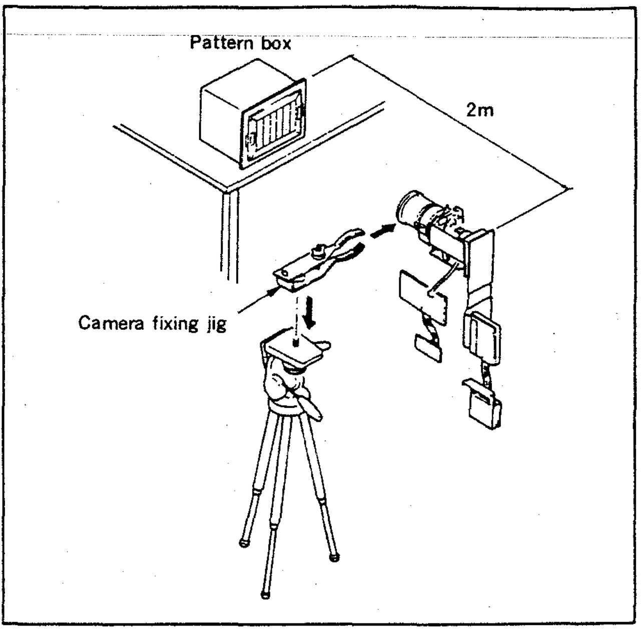

Pattern box
2m
Camera fixing jig

Fig. 1-2.

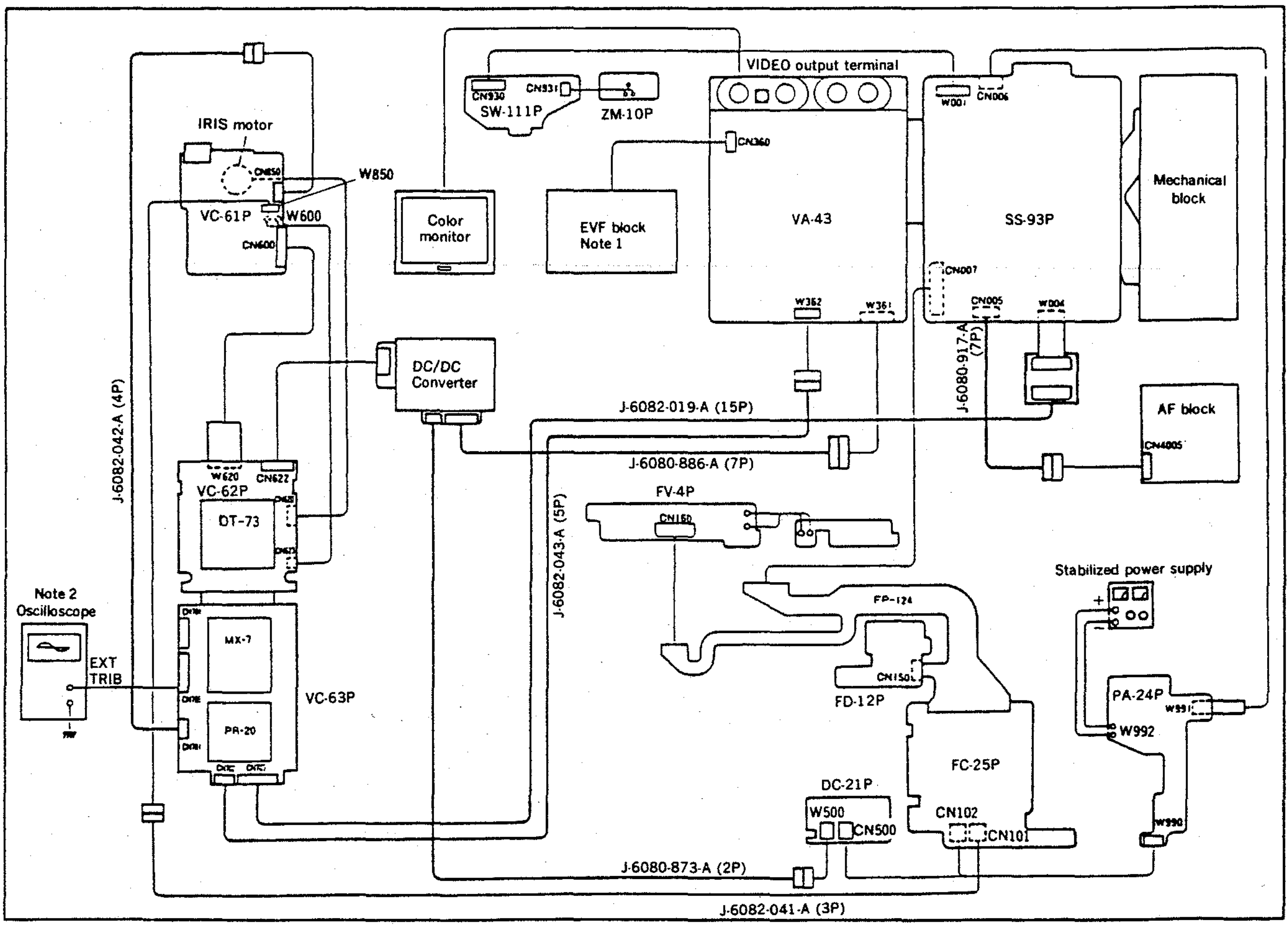

IRIS motor
CN850
W850
VC-61P
W600
CN600
CN930
CN931
SW-111P
ZM-10P
Color monitor
EVF block
Note 1
VIDEO output terminal
CN360
VA-43
W362
W361
W001
CN006
SS-93P
CN007
CN005
W004
Mechanical block
J-6080-917-A (7P)
AF block
CN4005
DC/DC Converter
J-6082-019-A (15P)
J-6080-886-A (7P)
J-6082-042-A (4P)
W620
CN622
VC-62P
DT-73
J-6082-043-A (5P)
FV-4P
CN160
Note 2
Oscilloscope
EXT
TRIB
MX-7
VC-63P
PR-20
FP-124
CN150
FD-12P
Stabilized power supply
+
−
PA-24P
W991
W992
FC-25P
DC-21P
W500
CN500
CN102
CN101
W990
J-6080-873-A (2P)
J-6082-041-A (3P)

Fig. 1-3.

1-3. CAUTIONS

1) Setting switches (only when the video unit is connected). Unless specified otherwise, set the switches to the following positons for adjustments;
   1. AUTO LOCK switch (FC-25P board S114) ......Manual (Lower side).

2) Adjusting sequence
   In principle, follow the indicated sequence.

3) Subjects
   1. Color bar chart (standard picture frame).
      When the color bar chart is used for the adjustment, adjust the picture frame as shown in Fig 1-4 (standard picture frame).

Color bar chart standard picture frame

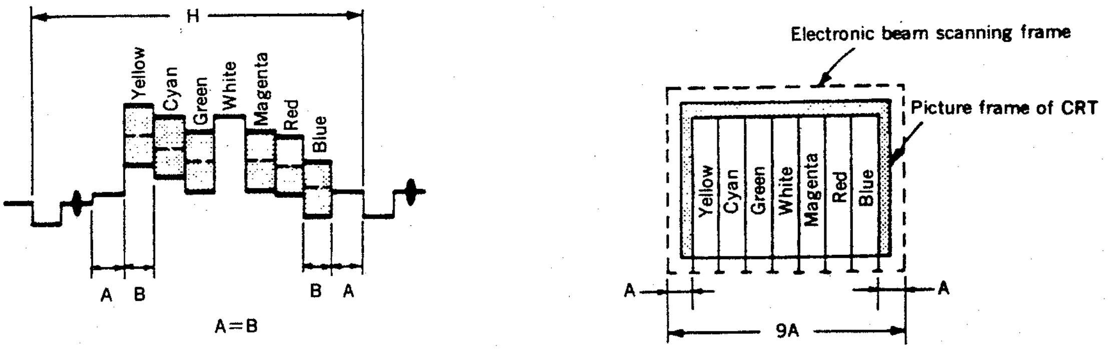

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
B A
A=B
Electronic beam scanning frame
Picture frame of CRT
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
A
9A

Fig. a [VA-43 board J361 (Video output) waveform]

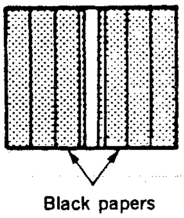
Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera in such a way that the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b are obtained.

Fig. 1-4.

2. Full white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (72mm).
3. High luminance pattern
   Prepare the high luminance pattern as shown in Fig. 1-5. and adjust the picture frame as shown in Fig. 1-6.
4. Siemens star (J-6080-875-A)
   Adjust the camera direction is such a way that the center of Siemens star coinsides with the center of monitor screen on the monitor TV screen.

High luminance pattern


Black papers

Cover the color bar chart with block papers, except a half of the width of white stripe and then display in the standard picture frame.

Fig. 1-5.

High luminance pattern

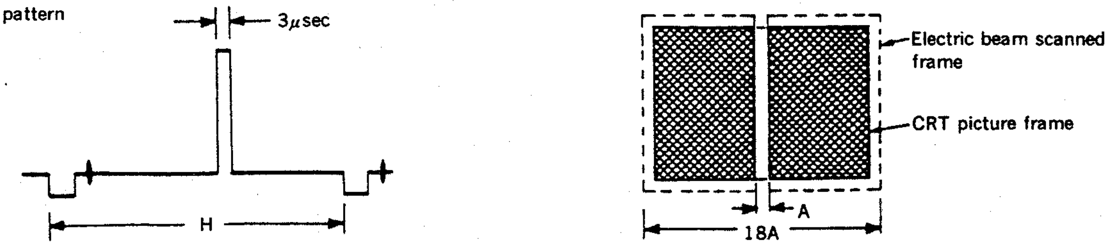

3μsec
H
Electric beam scanned frame
CRT picture frame
A
18A

Fig. a [VA-43 board J361 (picture output) waveform]

Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera until the output waveform of Fig. a and the monitor TV picture of Fig. b are displayed.

Fig. 1-6.

1-4. CAMERA SYSTEM ADJUSTMENT

1-4-1. Flange Back Adjustment

Subject	Siemens star (Position located 2 meters forward from the front of lens)
Measuring point	Checked with a monitor TV.
Measuring equipment	
Adjustment element	Adjust screw
Tools	Screw driver

[Adjustment Procedure]

1) Set AUTO LOCK SWITCH (FC-25P board S114) to "Manual" position (Lower side.)
2) Set the Siemens star at the position 2 meters forward from the front of lens.
3) Adjust the position of camera block in such a way that the center of Siemens star displayed on the monitor screen coincides with the center of monitor screen.
4) Make sure that the lens zoom lever smoothly moves to the extreme end of WIDE (8.5mm) and the extreme end of TELE (68mm) and then set the lever at the extreme end of WIDE (make sure that the zooming operation is functioning on the monitor screen at this time).
5) Open the IRIS by operating the backlight correcting switch (FC-25P board S109).
6) The end surface of "∞" side of stopper rubber should be set on the center of the 3 lines marked on the main lens cylinder (Refer to Fig. 1-7).

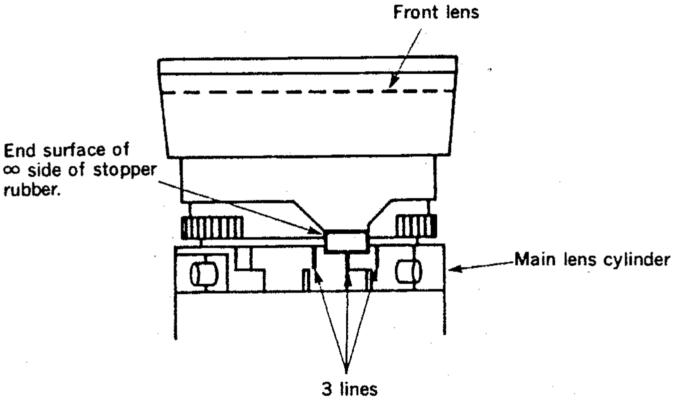


Fig. 1-7.

7) Loosen the setscrew (Refer to Fig. 1-8).
8) Insert a minus screw driver through the hole on rear lens cylinder and slightly turn the master lens frame with the edge of screw driver.
9) By turning the adjust screw, set the focus until the chart contrust becomes maximum (keep the setscrew loose at this time).
10) Readjust the focus by turning the focus ring.
11) Make sure that the ends of ∞ side of stopper rubber are kept within the range of 3 lines marked on the main lens cylinder (If not within the range, repeat the above 8) and 9)).
12) While holding the adjust screw, thus preventing it from turning, tighten the setscrew [If the position deviates, repeat the process starting from 6)] .
13) Repeat the adove 10) and 11) and check.

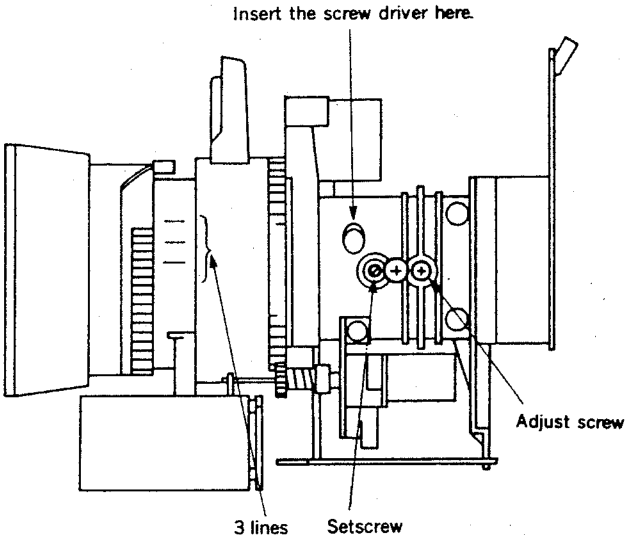


Fig. 1-8.

1-4-2. DC-DC Converter Voltage Check (VC-62P board)

Measuring equipment	Digital voltmeter
5V check	
Specified value	5.00±0.05Vdc
Measurement point	CN622 pin ①
15Vcheck	
Specified value	15.0±0.3Vdc
Measuring point	CN622 pin ④
32Vcheck	
Specified value	32.0±0.5Vdc
Measuring point	CN622 pin ⑤

Note: Connect EVF unit before checking.

[Check Procedure]

1) Make sure that each power supply voltage meets the specified value.

1-4-3. Voltage Adjustment (VC-61P board)

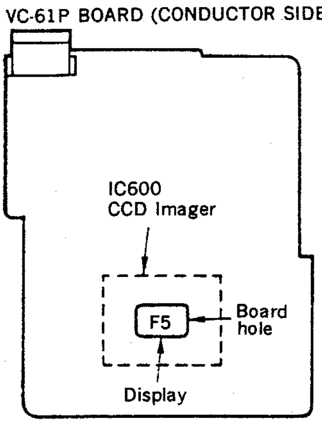
Subject	Arbitrary
Measurement point	CN601 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV600
Specified value	(Imager specified voltage) ±0.05Vdc

[Adjustment Procedure]

1) Set the voltage to (imager specified voltage)±0.05Vdc with RV600.

Note: V_{SUB}, specified voltage, is displayed on the imager with two digits: "integer symbol" and "decimal".

Integer Symbol	Integer Value
1	1
⋮	⋮
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19
K	20
L	21


VC-61P BOARD (CONDUCTOR SIDE)
IC600
CCD Imager
F5
Board hole
Display

(EXample)
For F5 display, integer symbol is F →15, and decimal value is 5→0.5 so V_{SUB} Voltage is 15+0.5=15.5 (Vdc).

Fig. 1-9.

1-4-4. PLL Adjustment (VC-62P board)

Subject	Optional
Measurement point	See Fig. 1-10
Measurement element	Digital voltmeter
Adjustment element	CT620
Specified value	2.5±0.1Vdc

[Adjustment Procedure]

1) Adjust to 2.5±0.1Vdc with CT620.

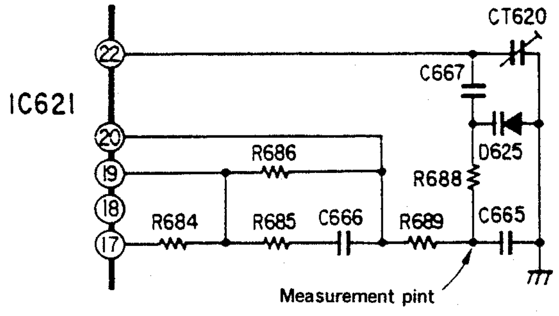

CT620
C667
IC621
22
20
19
18
17
R686
D625
R688
R684
R685
C666
R689
C665
Measurement pint

Fig. 1-10.

1-4-5. IRIS Set Adjustment (VC-62P board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement point	VC-61P board CN601 pin ① (CCD OUT)
Measurement element	Oscilloscope
Adjustment element	RV622 (IRIS)
Specified value	200±5mVp-p

[Adjustment Procedure]

1) Adjust the signal level to 200±5mVp-p with RV622. Do not use ND filter at this time.
   (Be sure to complete the adjustment by turning RV622 in the direction where the level is reduced).
2) Set ND filter 0.5 (0.4+0.1) on the front of lens and make sure that the signal level changes smoothly.
3) Remove ND filter and make sure that the signal level is within 200±15mV.
4) If the specified value is not met by these adjustment, repeat the above steps, 1) to 3).

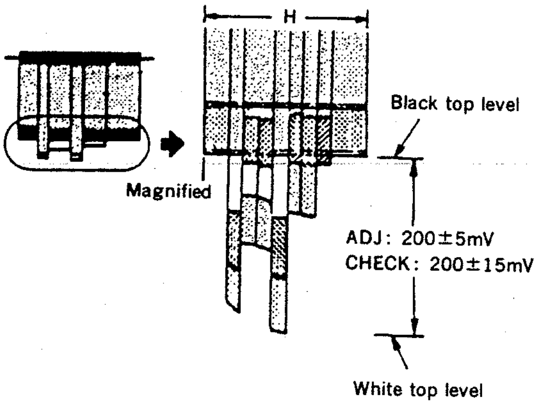

H
Black top level
Magnified
ADJ: 200±5mV
CHECK: 200±15mV
White top level

Fig. 1-11.

1-4-6. AGC Set Adjustment (VC-62P board)

Subject	Color bar chart standard picture frame
Measurement point	VC-63P board CN704 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV621
Specified value	160±5mVp-p

Note 1 : RV located next to VC-62P board should be set to the mechanical center before starting the adjusting operation.
1. RV620 (MAX GAIN)

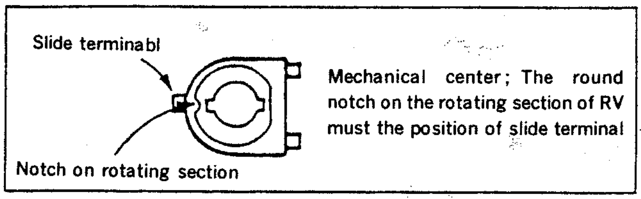

Slide terminabl
Mechanical center; The round notch on the rotating section of RV must the position of slide terminal
Notch on rotating section

Fig. 1-12.

Note 2 : When the adjustment is completed, be sure to perform "1-4-23. Max Gain Adjustment".

[Adjustment Procedure]

1) With RV621, adjust the signal level within 160±5mVp-p.

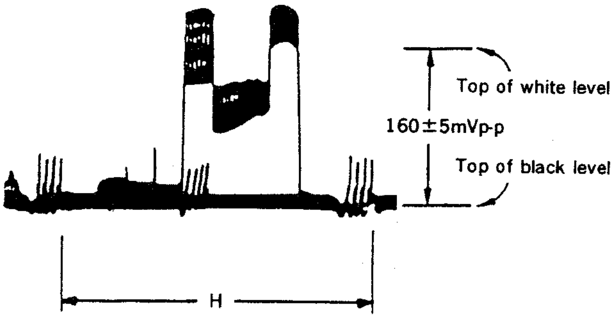


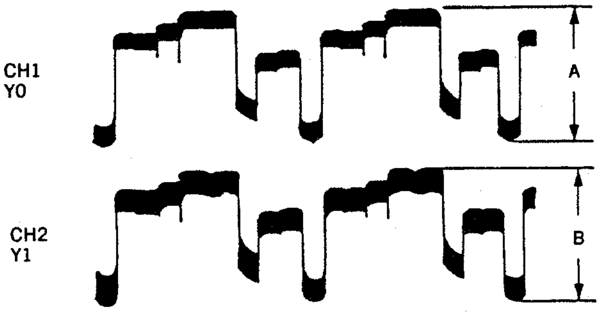
Fig. 1-13.

1-4-7. Matrix Adjustment (1) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63P board CN704 pin ④ (Y_0) CH2 : VC-63P board CN704 pin ⑤ (Y_1)
Measuring equipment	Oscilloscope
Adjustment element	RV706 (Y_1 Gain)
Specified value	Levels of Y_0 and Y_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV706 in such a way that the levels of Y_0 (CH1) and Y_1 (CH2) coincide with each other.



Adjust to A=B.

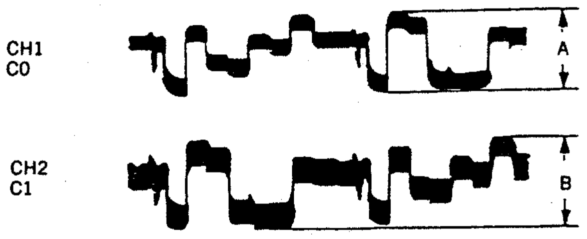
Fig. 1-14.

1-4-8. Matrix Adjustment (2) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63P board CN704 pin ⑥ (C_0) CH2 : VC-63P board CN704 pin ⑦ (C_1)
Measuring equipment	Oscilloscope
Adjustment element	RV707 (C_1 GAIN)
Specified value	Levels of C_0 and C_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV707 in such a way that the levels of C_0 (CH1) and C_1 (CH2) coincide with each other.



Adjust to A=B

Fig. 1-15.

1-4-9. Matrix Adjustment (3) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 bofrd (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV705 (C_2 Gain)
Specified value	Minimize breaking of luminescent spot in each color.

[Adjustment Procedure]

1) Adjust RV705 in such a way that the liminous point of each color is kept within 1 point or nearly 1 point

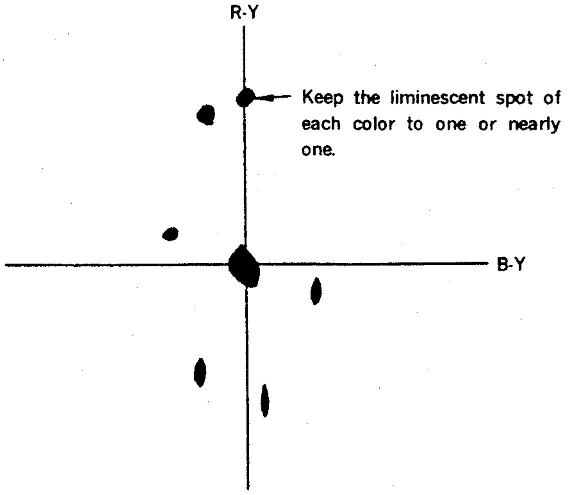


Fig. 1-16.

1-4-10. Y_H Level Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ④ (Y_H OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV701 (Y_H LEVEL)
Specified value	900±10mVp-p

[Adjustment Procedure]

1) Adjust RV701 in such a way that the white level is kept within 900±10mVp-p.

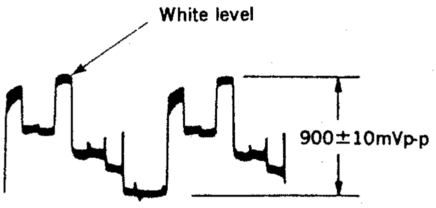


Fig. 1-17.

1-4-11. Chroma Level Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ② (Gr/G WB)
Measuring equipment	Oscilloscope
Adjustment element	RV710 (C LEVEL)
Specified value	320±10mVp-p

[Connection]

1) Before making adjustment, VC-63P board CN705 pin ③ and GND should be short circuited with a jumper.

[Adjustment Procedure]

1) Adjust RV710 until 320±10mVp-p is obtained.
2) After the adjustment, disconnect the jumper.

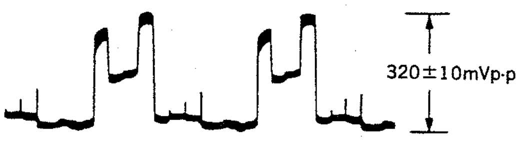


Fig. 1-18.

1-4-12. Brust Level Adjustment (VC-63P board)

Subject	All black (Cover the lens with black cap)
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV722
Specified value	180±5mVp-p

[Adjustment Procedure]

1) Adjust RV722 until the the brust level becomes 180±5mVp-p.

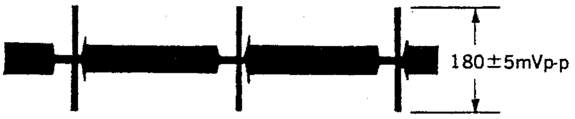


Fig. 1-19.

1-4-13. Brust HUE Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring equipment	Vectorscope
Adjustment element	RV721
Specified value	135±1°

[Adjustment Procedure]

1) Adjust with RV721 so that the burst phase on the vect scope becomes 135±1°

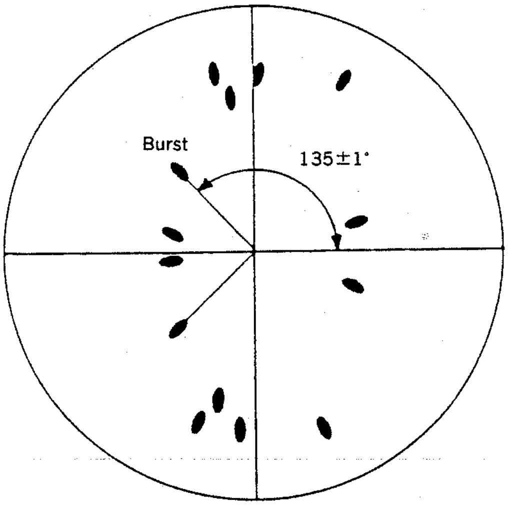


Fig. 1-20.

1-4-14. Pre-white Balance Adjustment (1) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV708 (R Gain), RV709 (B Gain)
Specified value	Minimize the carrier of white portion

[Adjustment Procedure]

1) The carrier of white portion is minimized by RV708 and RV709.

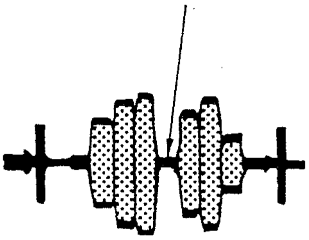

Amplitude of this white Portion is minimized.

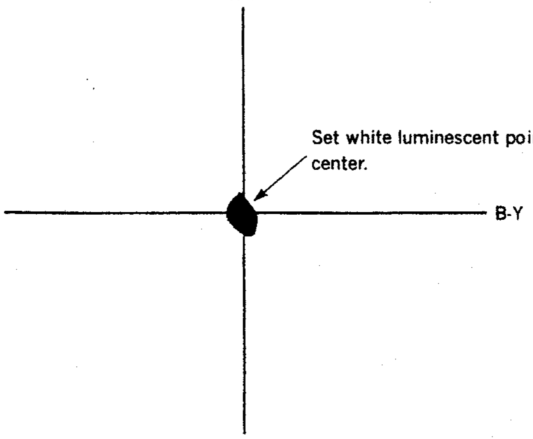
Fig. 1-21.

1-4-15. Pre-white Balance Adjustment (2) (VC-63P board)

Subject	All white pattern
Filter	Filter (for fine weather)
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV725 (R CONT), RV726 (B CONT)
Specified value	Set the white luminescent spot at the center

[Adjustment Procedure]

1) Set the filter (for fine weather) and adjust RV725 and RV726 so that the white luminescent point is set at the center.



Set white luminescent point at center.

Fig. 1-22.

1-4-16. Color Reproducibility Adjustment (Using vectorscope) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring equipment	Vectorscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN) RV712 (B-Y HUE), RV713 (R-Y HUB)
Specified value	Each color's luminescent spot must be within the frame of color reproducibility. (Fig. 1-23)

[Adjustment Procedure]

1) By alternately turning RV714, RV715, RV712 and RV713, adjust the luminescent spot of each color until it is held within the frame of color reproducibility.

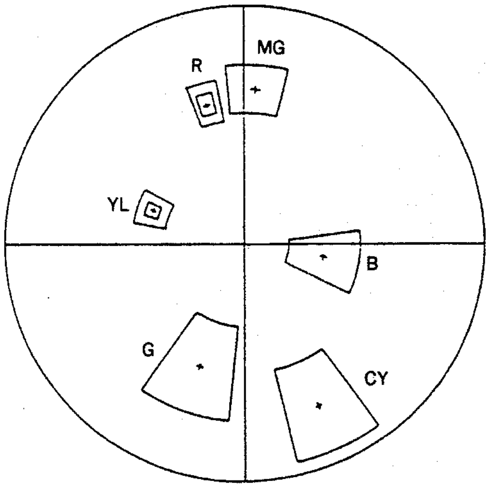
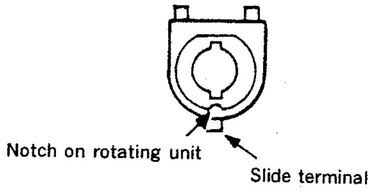


Fig. 1-23.

1-4-17. Color Reproducibility Adjustment (Using Oscilloscope)

A. Gain adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN)
Specified value	"Red" level : 340±20mVp-p "Yellow" level : 240±15mVp-p



Mechanical center; The round notch on rotating until of RV and the slide terminal must be matched at the same position.

Fig. 1-24.

[Adjustment Procedure]

1) Set RV712 (B-Y HUE) and RV713 (R-Y HUE) on the mechanical center (Refer to Fig. 1-24).
2) Adjust the amplitude of "Red" to 340±20mVp-p by RV715.
3) Adjust the amplitude of "Yellow" to 240±15mVp-p by RV714.

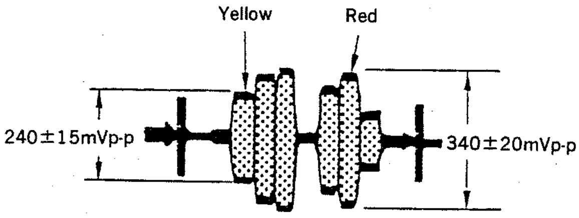


Fig. 1-25.

B. HUE Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y mode)
Adjustment element	RV712 (B-Y HUE), RV713 (R-Y HUE)
Specified value	Each color luminescent spot must be within the frame of color reproducibility.

[Adjustment Procedure]

1) Adjust RV712 and RV713 until the luminescent spot of R and Y_L is set within the frame of color reproducibility.

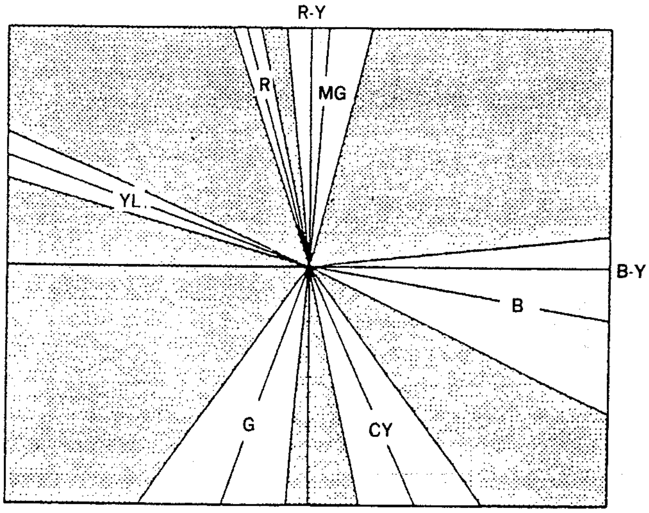


Fig. 1-26.

1-4-18. SET UP Adjustment (VC-63P board)

Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV719
Specified value	30±5mVp-p

[Adjustment Procedure]

1) Adjust SET UP level to 30±5mVp-p by RV719.

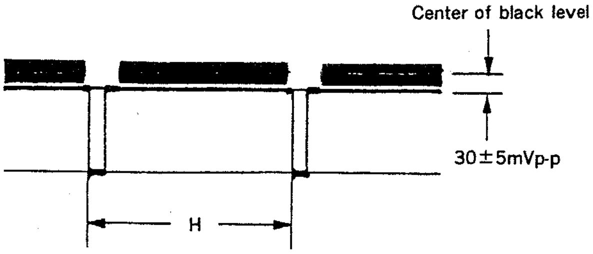


Fig. 1-27.

1-4-25. Automatic White Balance Check

Subject	All white pattern
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode

[Check Procedure]

1) Make sure that the white luminescent stop is at the original point.

1-4-26. Backlight Correction Check

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (Video output terminal)
Measuring equipment	Oscilloscope

[Check Procedure]

1) Push the backlight correction button (FC-25P board S109).
2) Make sure that the output level increases.

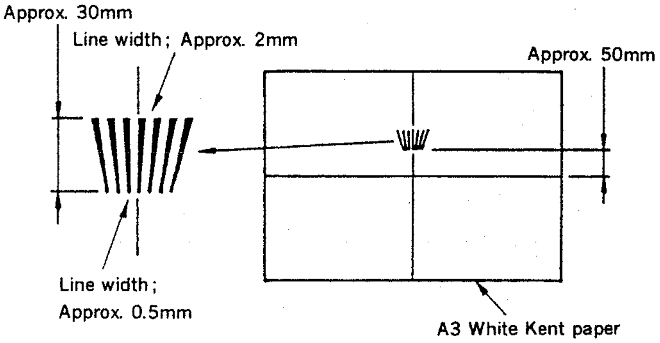
1-5. AUTO FOCUS ADJUSTMENT

1-5-1. AF Measurement Distance Adjustment

Subject	AF measurement adjust chart (Refer to Fig. 1-34)
Measurement point	Check with monitor TV.
Measuring equipment	Check with monitor TV.
Adjustment element	Measured distance adjust screw
Tool	Hexagonal wrench (1.25mm)

[Adjustment Procedure]

1) Set the chart at 2 meters forward from the front of lens.
2) Set the lens zoom lever on the TELE terminal and set the center of monitor on the center of chart.
3) Insert the hexagonal wrench into the hole located on the lower side of unit and set the focus by turning AF adjust screw (Refer to Fig. 1-35).
4) Remove the focus ring by turning it with your hand ensuring no overrunning of focus, that is, the focus is not deviated after it is properly set once when the ring is turned to ∞ side and the hand is released or when the ring is turned to 1.2m side and the hand is released.
5) When the focus overruns in the above 4), repeat the above 3) and 4).
6) Close the AF adjust hole of cabinet.



AF measuring chart

Fig. 1-34.

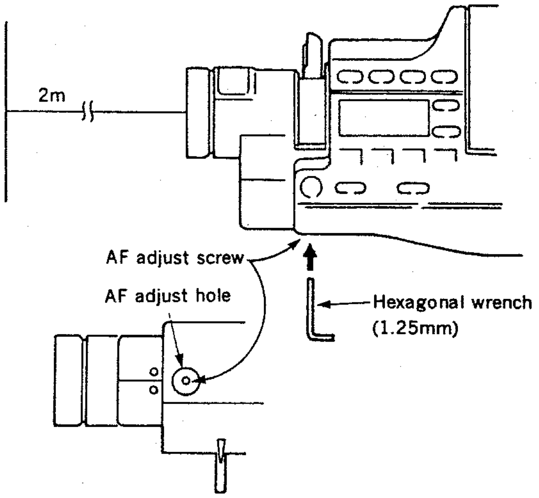


Fig. 1-35.

1-6. DIGITAL TITLER BLOCK ADJUSTMENT

1-6-1. AD Converter Level Adjustment (SS-93P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	⊕ Probe : IC203 pin ② ⊖ Probe : IC203 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV200
Specified value	200±5mVdc

[Adjustment Procedure]

1) Adjust the voltage to 200±5mVdc by RV200.

1-6-2. Chroma Blanking Level Adjustment (VC-63P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV711
Specified value	Minimize the carrier

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101) or "Titl 2" button (FC-25P board S102).
2) Push "Memory" button (FD-12P board S153), thus memorizing "All black".
3) Select the white color by pushing the color button (FD-12P board S154).
4) Minimize the carrier by RV711.

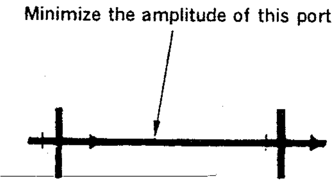


Fig. 1-36.

1-6-3. Y Level of Titler Adjustment (VC-63P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap).
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV724
Specified value	570±10mVp-p

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101) or "Title 2" button (FC-25P board S102).
2) Push "Memory" button (FD-12P board S153), thus memorizing "All black".
3) Select the white color by pushing "color" button (FD-12P board S154).
4) By operating RV724, set the value to 570±10mVp-p.

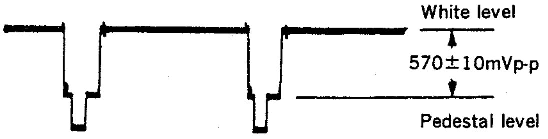


Fig. 1-37.

1-6-4. PLL Error Voltage Adjustment (SS-93P board)

Mode	Camera stand-by
Subject	Arbitrary
Measurement point	Refer to Fig. 1-38
Measuring equipment	Digital voltmeter
Adjustment element	CT200
Specified value	2.50±0.05V

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101).
2) Make sure that IC202 pin ㊹ is higher than 4.0V.
3) Push "Memory" button (FD-12P board S153).
4) By adjusting CT200, set the voltage of measured point (Refer to Fig. 1-38)

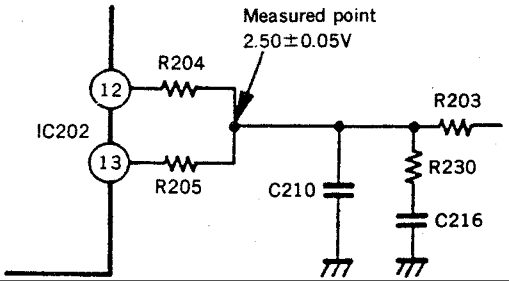
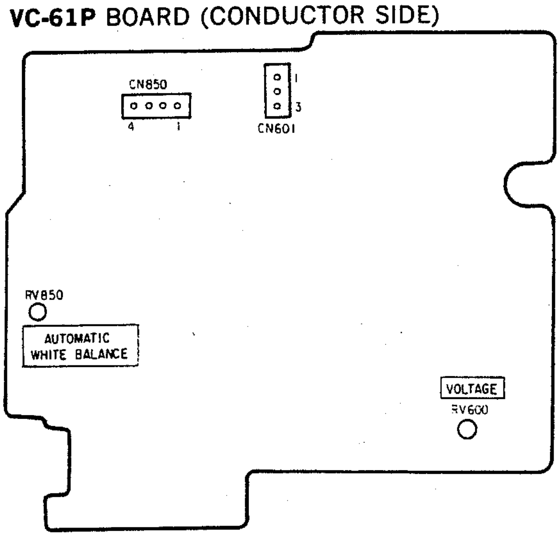


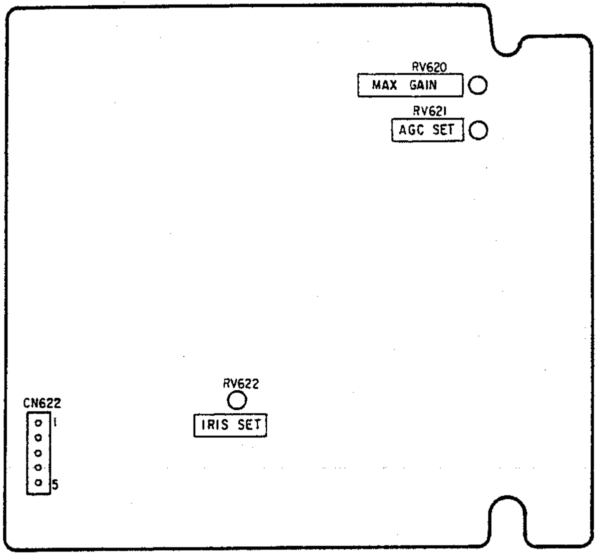
Fig. 1-38.

1-7. ADJUSTING PARTS LOCATION DIAGRAM

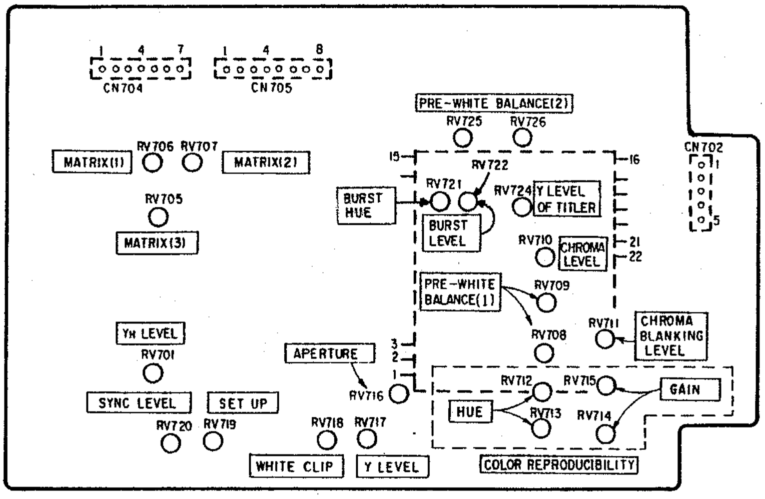
VC-61P BOARD (CONDUCTOR SIDE)


CN850
4
1
CN601
1
3
RV850
AUTOMATIC WHITE BALANCE
VOLTAGE
RV600

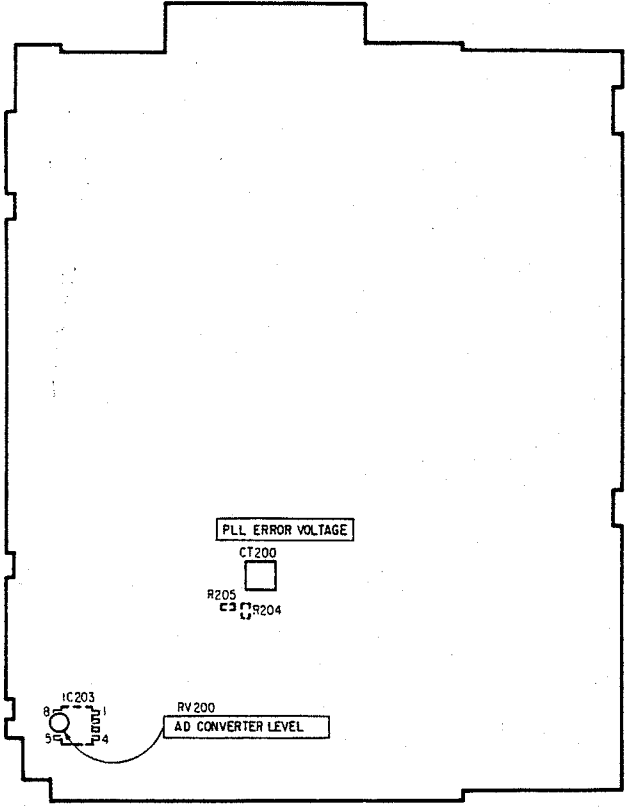
VC-62P BOARD (CONDUCTOR SIDE)


RV620
MAX GAIN
RV621
AGC SET
RV622
IRIS SET
CN622
1
5

VC-63P BOARD (CONDUCTOR SIDE)


1 4 7
CN704
1 4 8
CN705
PRE-WHITE BALANCE(2)
RV725
RV726
MATRIX(1)
RV706
RV707
MATRIX(2)
RV705
MATRIX(3)
15
16
RV722
RV721
BURST HUE
BURST LEVEL
RV724
Y LEVEL OF TITLER
RV710
CHROMA LEVEL
21
22
PRE-WHITE BALANCE(1)
RV709
RV708
RV711
CHROMA BLANKING LEVEL
CN702
1
5
YH LEVEL
RV701
APERTURE
3
2
1
RV716
SYNC LEVEL
SET UP
RV720
RV719
RV718
RV717
WHITE CLIP
Y LEVEL
RV712
RV715
GAIN
HUE
RV713
RV714
COLOR REPRODUCIBILITY

SS-93P BOARD (CONDUCTOR SIDE)


PLL ERROR VOLTAGE
CT200
R205
R204
IC203
8
1
5
4
RV200
AD CONVERTER LEVEL

SECTION 2
MECHANICAL SYSTEM ADJUSTMENT

For disassembling the cabinet and each board, refer to the Service Manual, SECTION 2 Disassembly

2-1. HOW TO DISASSEMBLE LENS UNIT

2-1-1. How to Remove Camera Frame (Refer to Fig. 2-1)

1) Remove two screws ❶ and disassemble VC shield case ❷.
2) Remove camera frame ❸.
3) Remove screw ❹ and SW board ❺.

For mechanical adjustments, please refer to separate manual "Video 8 / O MECHANISM" (Order No.: 72010-508.00)

4) Remove ❹ screws ❻ and camera frame ❼.
5) Remove AF shield plate ❽ and AF cover ❾.

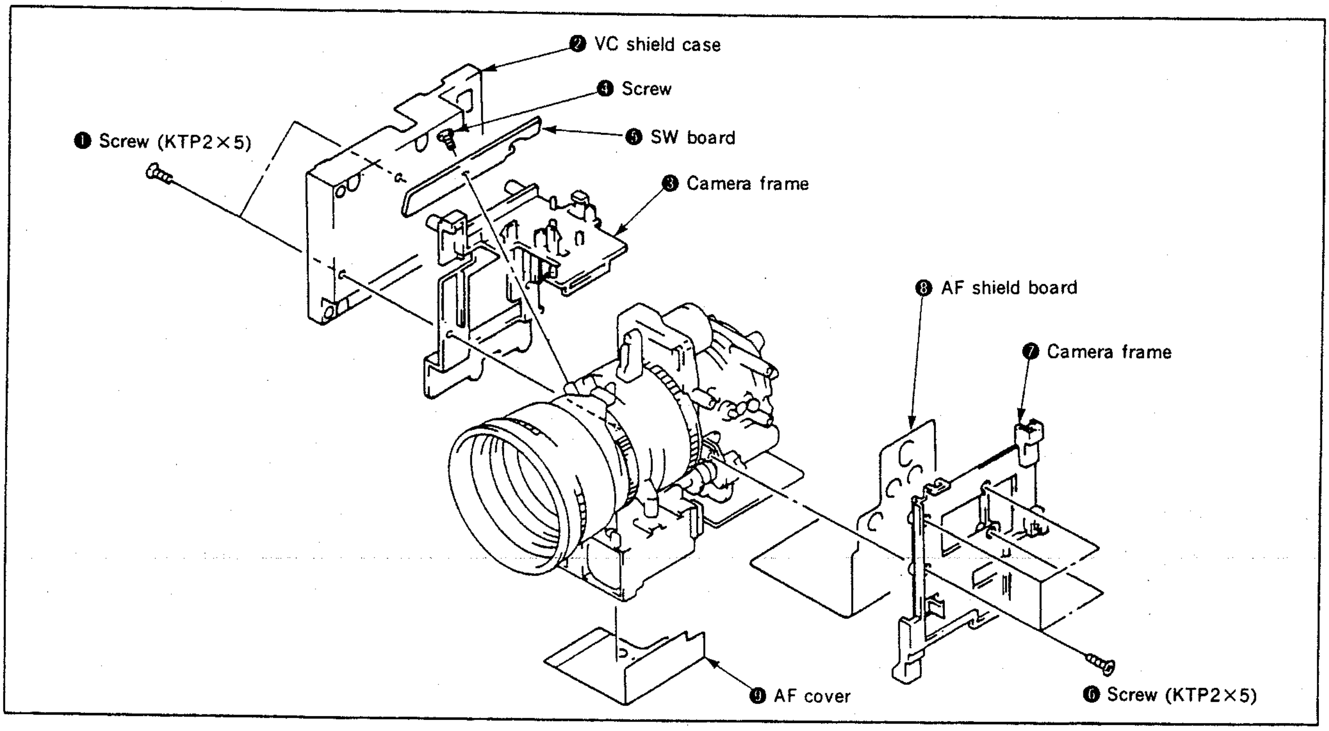

❷ VC shield case
❹ Screw
❶ Screw (KTP2×5)
❺ SW board
❸ Camera frame
❽ AF shield board
❼ Camera frame
❾ AF cover
❻ Screw (KTP2×5)

Fig. 2-1.

2-1-2. How to Remove AF Board (Refer to Fig. 2-2)

1) Remove screw ❶ and then remove AF board ❷.
2) Remove 4 connectors ❸.

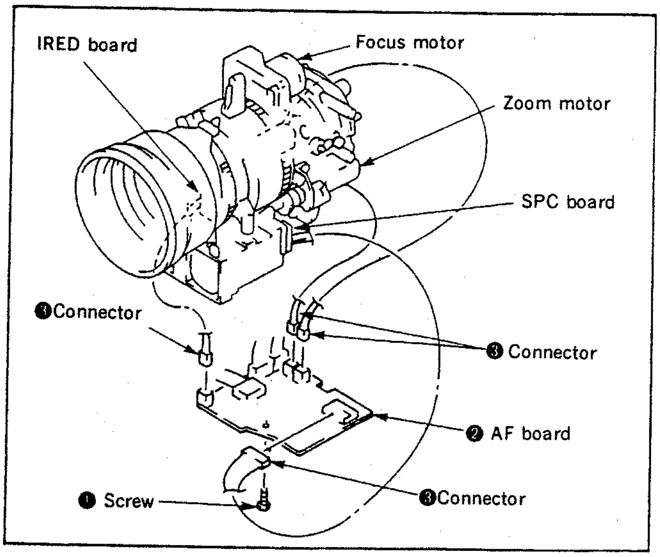

IRED board
Focus motor
Zoom motor
SPC board
❸Connector
❸ Connector
❷ AF board
❶ Screw
❸Connector

Fig. 2-2.

2-1-3. How to Remove Focus Motor and Zoom Motor (Refer to Fig. 2-3)

1) Remove screw ❶ and than remove zoom motor ❸.
2) Remove screw ❸ and then remove focus motor ❹.

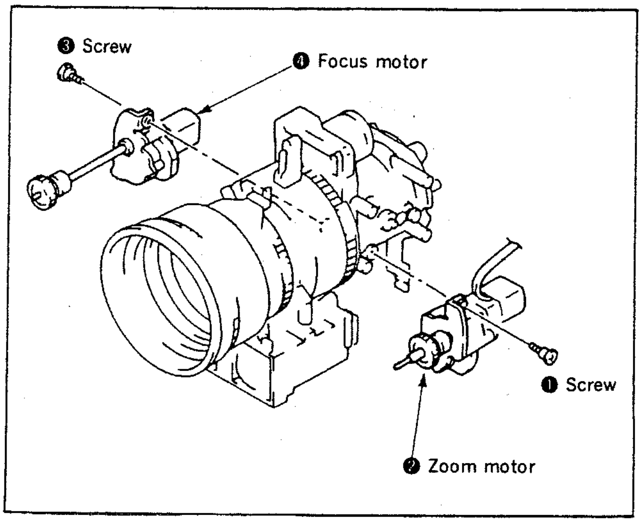

❸ Screw
❹ Focus motor
❶ Screw
❷ Zoom motor

Fig. 2-3.

2-1-4. How to Remove AF Block (Refer to Fig. 2-4)

1) Remove 2 screws ❶ and then remove AF block ❷.

Note: The screw on the IRED lens cylinder side is covered with a tape and can not be seen. Be sure to affix the tape when reassembling.

Note: When mounting AF block, make sure that the distance ring can surface ⓐ and prism arm ⓑ are properly assembled.

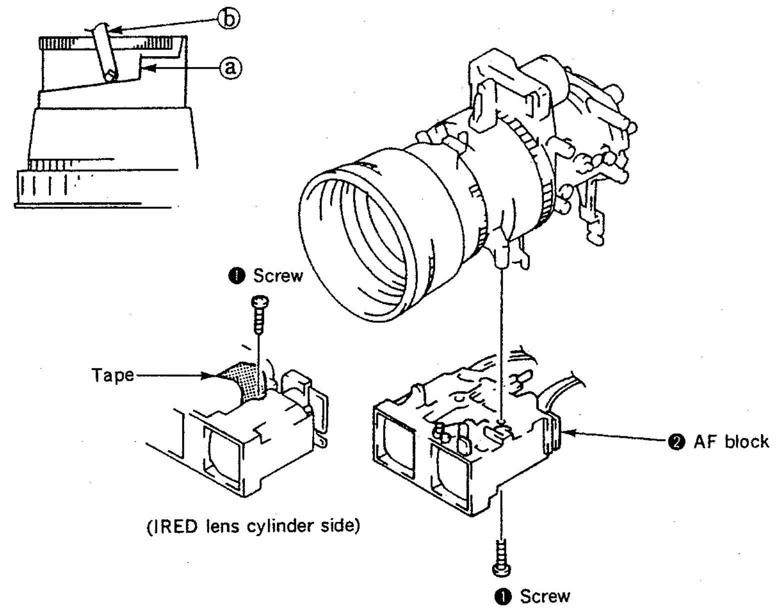

ⓑ
ⓐ
❶ Screw
Tape
❷ AF block
(IRED lens cylinder side)
❶ Screw

Fig. 2-4.

2-1-5. How to Remove Relay Lens Cylinder Unit (Refer to Fig. 2-5)

1) Remove 2 screws ❷.
2) Remove eccentric roller ❷ and then remove relay lens cylinder unit ❸.

Note: After reassembling, be sure to adjust the back focus.

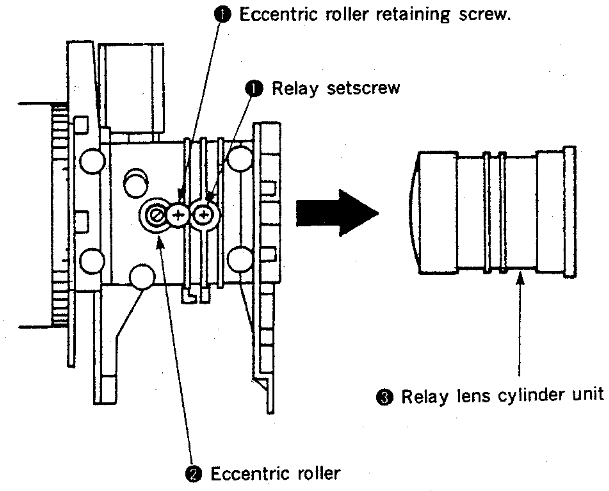

❶ Eccentric roller retaining screw.
❶ Relay setscrew
❸ Relay lens cylinder unit
❷ Eccentric roller

Fig. 2-5.

2-1-6. How to Remove IRIS Motor (Refer to Fig. 2-6)

1) Remove light shield plate ❶.
2) Remove screw ❷ and then remove IRIS motor ❸.

Note: Make sure not to deform the iris blades after removal. Iris blades are easily removed from the blade studs. keep them inserted properly
(Do not directly touch blades with hands. Use a pair of tweezers).
(Refer to 2-1-7. How to Remove Iris Blades).

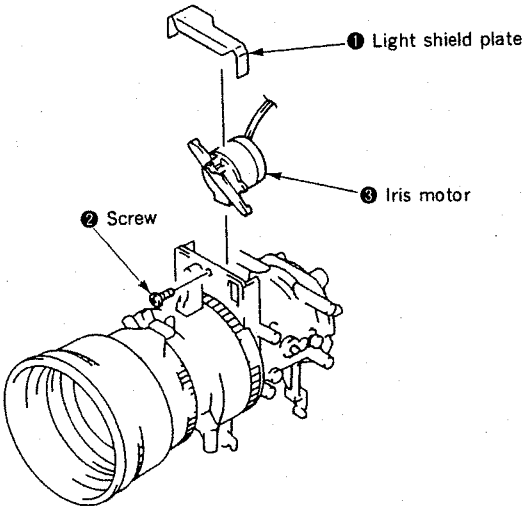

❶ Light shield plate
❸ Iris motor
❷ Screw

Fig. 2-6.

2-1-7. How to Remove Iris Blades (Refer to Fig. 2-7).

1) Remove the iris motor (Refer to 2-1-6. How to remove iris motor).
2) Set each blade stud into ⓐ section of iris blade A and remove iris blade A.
3) Remove iris blade B in the same manner.

Note : Make sure not to directly touch the blade with hands. Use a pair of tweezers.

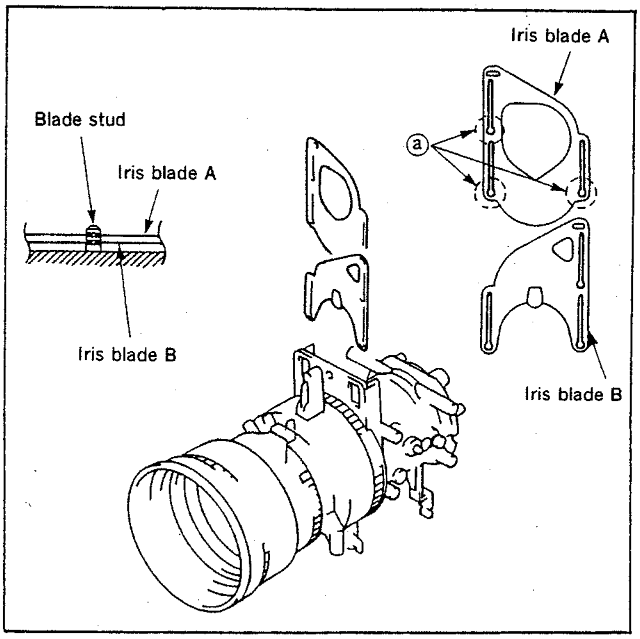

Iris blade A
Blade stud
Iris blade A
ⓐ
Iris blade B
Iris blade B

Fig. 2-7.

2-1-8. How to Remove Zoom Ring (Refer to Fig. 2-8)

1) Remove the camera frame, AF board, focus motor, zoom motor and AF block (Refer to 2-1-1~2-1-4).
2) Remove screw ❶ and then remove N stopper ❷.
3) Remove focus lens assy ❸.
4) Peel off zoom seat ❹.
5) While holding the focus side downward, remove 3 screws ❺.
6) Set the focus side upward without removing fixed lens cylinder ❻.
7) While keeping the zoom on the telescope side, remove 2 screws ❼.
8) Remove fixed lens cylinder ❻ by lifting it straight up.
9) Remove zoom ring ❽ and cam ring ❾ from the fixed lens cylinder.

2-1-9. How to Mount Zoom Ring (Refer to Fig. 2-8)

1) Set cam ring ❾ and zoom ring ❽ on fixed lens cylinder ❻.
   Note : Match a of cam ring to that of zoom ring.
2) Slowly install fixed lens cylinder ❻ from directly above.
   Note : Set ⓑ of relay holder into each positioning hole of fixed lens cylihder.
3) Set the zoom on the telescope side and tighten two screws ❼.
   Note : Move the zoom between telescope and wise angle, ensuring that the zoom moves smoothly.
4) While not removing the fixed lens cylinder and setting the focus side downward, tighten 3 screws ❺.
5) Mount focus lens assy ❸ on the fixed lens cylinder.
6) Mount N stopper ❷ and tighten screw ❶.
7) Affix zoom seat ❹.
8) Mount AF block, zoom motor, focus motor, AF board and camera frame (Refer to 2-1-1~2-1-9).
9) Check the AF measurement distance. Adjust it if deviated (Refer to 1-5-1 AF measurement distance adjustment).

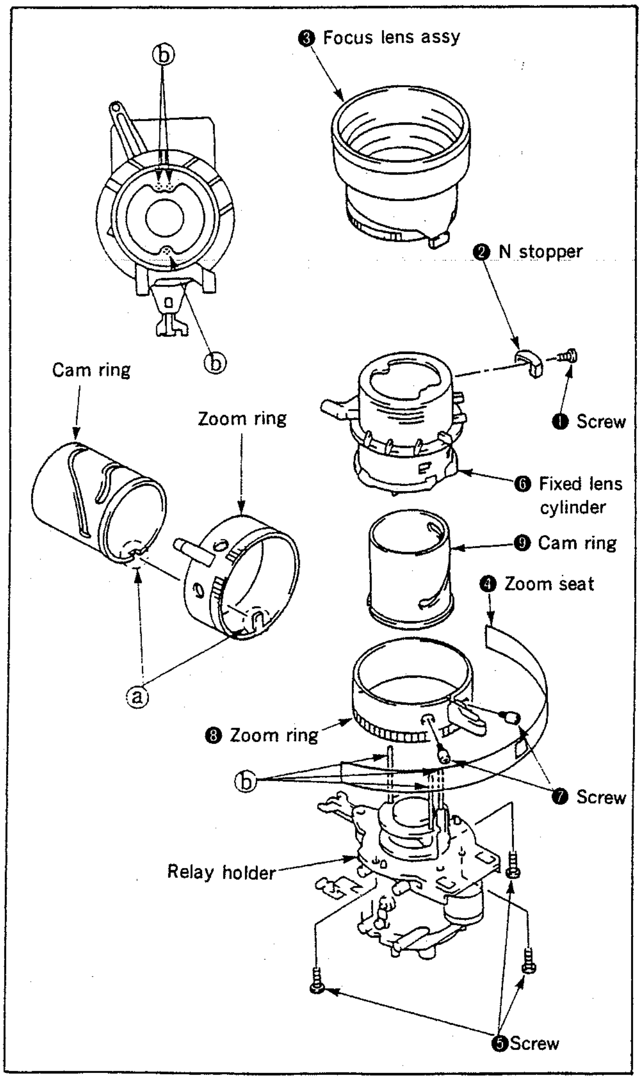

❸ Focus lens assy
ⓑ
❷ N stopper
Cam ring
ⓑ
Zoom ring
❶ Screw
❻ Fixed lens cylinder
❾ Cam ring
❹ Zoom seat
ⓐ
❽ Zoom ring
ⓑ
❼ Screw
Relay holder
❺Screw

Fig. 2-8.

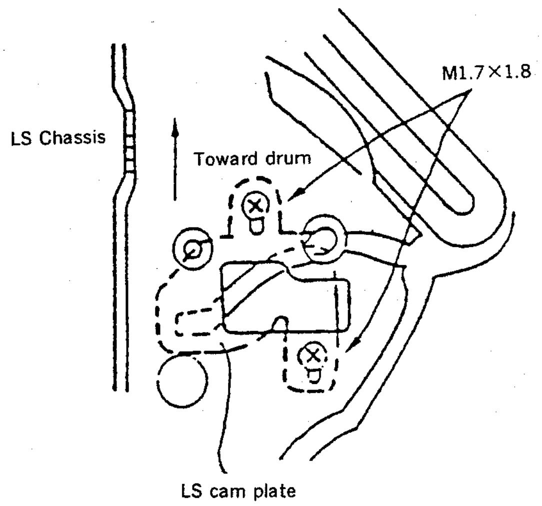
2-2. LS CAM PLATE ADJUSTMENT PROCEDURE

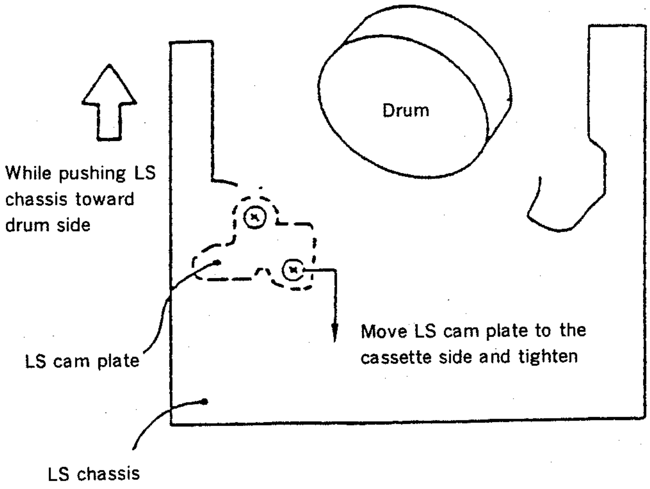
This method is required when LS chassis, LS cam plate, mechanical chassis or LS gear C is replaced.

Note : When LS chassis, LS cam plate, mechanical chassis or LS gear is replaced, make adjustments according to the following adjust procedures ;

LS cam plate adjustment

1. Temporarily set LS cam plate on the rear side of LS chassis and apply grease in the groove (set on the drum side with 2 screws, M1.7×1.8).
2. When LS chassis has been mounted on the mechanical chassis ;
   - ❶ Loosen the two screws, M1.7×1.8
   - ❷ and while pushing LS chassis toward the drum side,
   - ❸ Move LS cam plate toward the set side (opposite side of drum) and tighten the screws.


LS Chassis
Toward drum
M1.7×1.8
LS cam plate


Drum
While pushing LS chassis toward drum side
Move LS cam plate to the cassette side and tighten
LS cam plate
LS chassis

SECTION 3
ELECTRICAL ADJUSTMENT

See the adjusting part location diagram from on page 41 for the adjustment.

The following measuring instruments are needed in adjusting the VTR section.

[Equipment Required]

1) Monitor TV.
2) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10 : 1, unless otherwise specified.)
3) Frequency counter
4) Pattern generator with Video output terminal.
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tapes
    For tracking adjustment (WR5-1C)
      Part number : 9-967-995-06
    For Video frequency response adjustment (WR5-6C) * 1
      Part number : 8-967-995-17
    For operation check (WR5-4CL) * 2
      Part number : 8-967-995-56
    For operation check (WR5-5CSP) * 3
      Part number : 8-967-995-47
      * 1 : WR5-2C (8-967-995-16) is also available.
      * 2 : WR5-3CL (8-967-995-36) is also available.
      * 3 : WR5-3CSP (8-967-995-46) is also available.

[Precaution for Adjustment]

Except the "Battery down adjustment" used for the adjustment of system control and the "Inside EVF indication position adjustment" used for the adjustment of VIDEO, the VIDEO unit can be adjusted by removing the camera unit. For removing the camera unit, disconnect the following 4 connectors ;

DC-DC converter must be connected to the VTR unit at this time.

1. VC-62P board CN622
2. VC-63P board CN702
3. VC-63P board CN703
4. SS-93P board CN005

*1, *2, *3

For all available GRUNDIG Alignment Tapes please refer to Service Jigs and Tools (Part 1) on page S 3.

EVF (Electric viewfinder) is necessary only for the "Battery down adjustment".

When removing EVF unit, disconnect the following connector :

1. VA-43 board CN360

Microphone board (MC-36 board) is not required for the adjustment of VIDEO unit. For removing the microphone board, disconnect the following connector ;

1. VA-43 board CN361

[Equipment Connection]

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

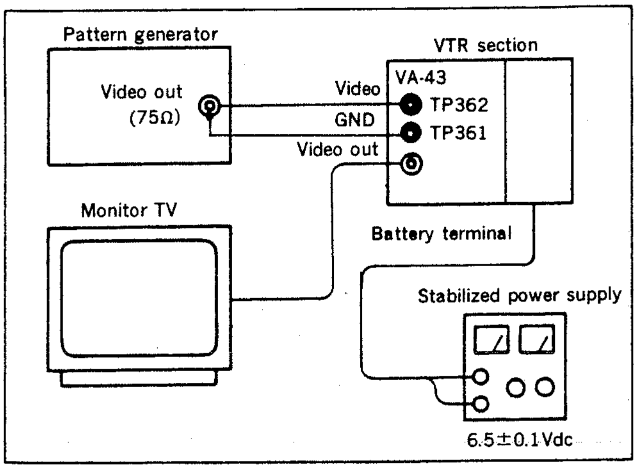


Fig. 3-1.

[Setting up for Adjustment]

Video signals output by an pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard.

Connect an oscilloscope to TP362 (TP361 : GND) on the VA-43 board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and burst signals are flat at approximately 0.3, 0.7 and 0.3V respectively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 3-2 shows video signals (color bars) used in the video section adjustments.

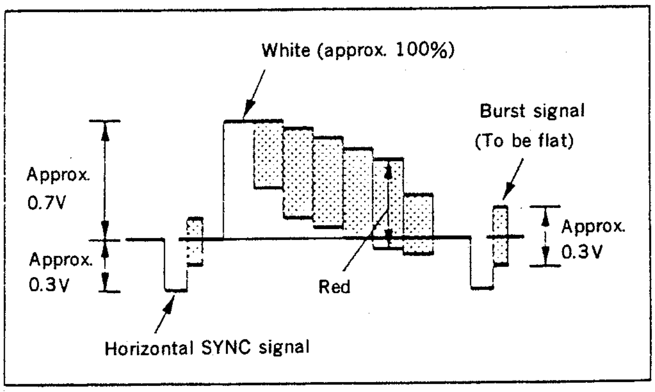
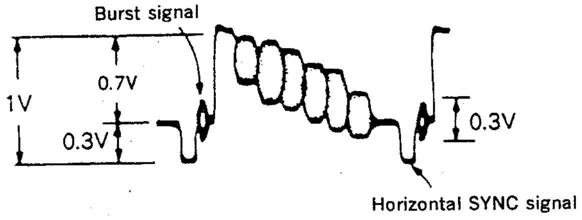
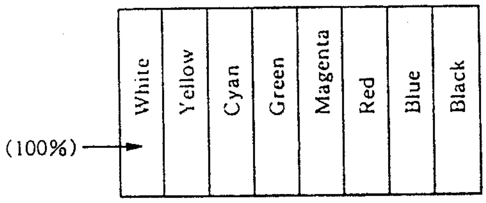


Fig. 3-2. Pattern Generator Color Bar Signals

[Alignment tape]

Tape	Description	Use for
Tracking (WR5-1C)	1. Recording area : PCM—Video 2. Recording content : CH2 : 1MHz linearity adjustment signal (CH1 : 9MHz)	Drum linearity adjustment
Video frequency Charactcristics (WR5-6C)	1. Recording area : Video 2. Recording content : RF sweep 0 to 10MHz 3. Marker : 1, 3.58, 5.5 and 7MHz	Frequency charactcristics adjustment
Operation checking SP mode (WR5-5CSP) LP mode (WR5-4CL) Note: PCM area is not included in WR5-4CL	1. Recording area : Video 2. Recording content : ■ Video area ● Video signals Color bar : 4min. Monoscope : 4min. [Color bars]  Burst signal 1V 0.7V 0.3V 0.3V Horizontal SYNC signal  White Yellow Cyan Green Magenta Red Blue Black (100%) ● Audio signal (AFM) 400Hz, 60% modulation ■ PCM area ● Audio signal (PCM) 1kHz, 4min. Color bar section 20Hz, 20sec. 400Hz, 20sec. } Iterative 14kHz, 20sec.	Operation checking

[Required level and impedance of input/output signal]

Video output	Pin jack Output signal : 1Vp-p, 75Ω unbalance, sync negative
Audio output	Pin jack Specified output : −10dBs Loading impedance : less than 10kΩ

[Service Mode]

This machine in provided with the service mode used for the adjustment and function checks.

1. STARTING SERVICE MODE

When SVP land (K IN 2 (CN160 pin ⑥) and KOUT5 (CN160 pin ⑩)) of FV-4P board are shortcircuited for more than 0.2 sec., the service mode 1 is started and all segment of LCD is turned "ON". Hereafter, whenever SVP land is shortcircuited, the mode is changed as follows;

Service mode 2
↓
Service mode 3
↓
Service mode 4
↓
Service mode 5
↓
Service mode 6
↓
Service mode 7

The service mode number is shown by the last digit of LCD (Except Service Mode 1).

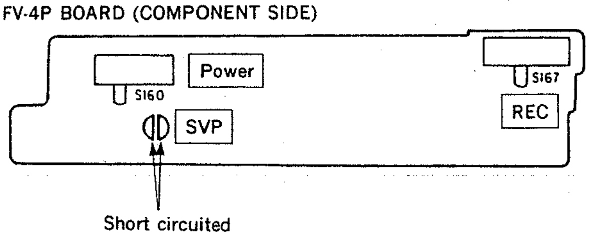

FV-4P BOARD (COMPONENT SIDE)
Power
S160
SVP
S167
REC
Short circuited

Fig. 3-3. SVP land

2. RELEASING SERVICE MODE

For releasing the service mode, set Service Mode 7 and shortcircuited SVP land, thus indicating "-- : -- : --" on LCD. Then push the date button to return to the counter display.

The service mode can also be released by turning "off" the power switch in the service mode.

3. DISPLAY ON LCD

In the service mode, except in the service mode 1, the following codes are displayed ft ①, ②, ③ and ④ on LCD (Liquid crystal display) (Refer to Fig. 3-4)

Section ①

- Service mode 2, 3
  Data of slow tracking control: Initial value BE (1F~FF)
- Service mode 4, 5
  Currently executed operation mode (Refer to Table 3-1)
- Service mode 6
  Battery level
- Service mode 7
  Key code from mode control to mechanical control.

Section ②

- Service mode 2, 3
  Data of JOG VD: Initial value 48 (1F~FF).
- Service mode 4, 5 and 6
  If there is no operation mode to be executed next (Refer to Table 3-1) or there is no new operation command, the currently executed operation mode is displayed.
- Service mode 7
  Displays the warning code for the last trouble occurred while the set is used. Memory is preserved as long as the lithium battery is functioning.

③ Warning code

When a trouble occurs, its cause is shown by one digit code (Refer to Table 3-2).

Note: Service mode 1 and 7 are not included.

④ Service mode No.

Note: Service mode 1 is not included.

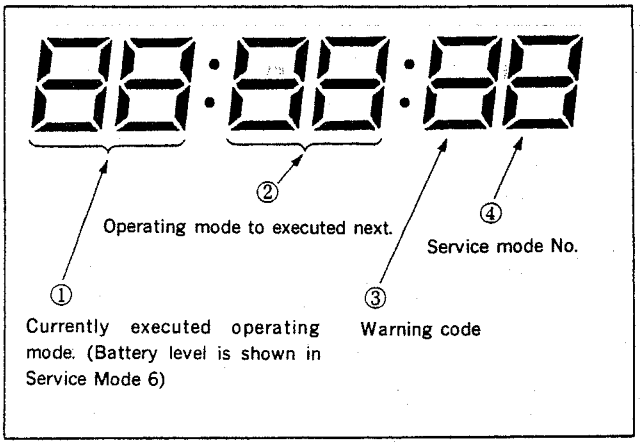

88:88:88
②
Operating mode to executed next.
④
Service mode No.
①
Currently executed operating mode. (Battery level is shown in Service Mode 6)
③
Warning code

Fig. 3-4. Display on LCD

Table 3-1. Table of Operating Mode Codes

Code	Operating mode	Code	Operating mode	Code	Operating mode
2C	EJECT	8C	COUNTER RESET	27	FADER OFF
30	STOP	8E	MEM CNTR ON/OFF	A0	DDS SEL
32	PAUSE	B2	ZERO RETURN	A1	SHIFT
34	PB	33	CAM REC	A2	UP
36	REW	3B	INSERT	A3	SVP
38	FF	65	EDIT REV	A4	AF
3A	REC	67	EDIT CUE	A5	AWB
44	SLOW 1/10	69	REC REVIEW	A6	FADER
46	SLOW 1/5	35	TELE	A7	REC PAUSE
62	FRAME	37	WIDE	A8	BACK LIGHT
64	−X1	25	FADER ON	FF	KEY OFF CODE

Table 3-2. Table of Warning Codes

Code	Cause of stop for trouble (Trouble is detected by mechanical control, SS-93P board IC001)
0	Normal
1	Trouble with loading/unloading
2	Trouble with capstan speed (pulse is not input into IC001 ⑱ pin (CFG))
3	Trouble with capstan speed (pulse frequency of IC001 ⑱ pin (CFG) is too high).
4	Trouble with reel revolution (pulse is not input into IC001 (63) pin (T REEL FG) or (64) pin (S REEL FG)).
5	Trouble with drum revolution (pulse frequency of IC001 ⑰ pin (DFG) is too high or low).
6	Trouble with drum phase (drum is not phase locked)

4. DESCRIPTION OF EACH SERVICE MODE

[Service Mode 1]

All segments of LCD are lighted.

[Service Mode 2]

In the CAMERA mode, "><" mark is displayed at the center of lower part of monior TV picture, and "Display position in EVF can be adjusted".

[Service Mode 3]

Playback mode in which "switching position adjustment" can be made.

[Service Mode 4]

Playback mode in which "CH1'" playback frequency characteristics adjustment" can be made.

[Service Mode 5]

1) Emergency stop by the following trouble detection is prohibited.
   1. Dew detection
   2. Battery down detection
   3. Loading/unloading trouble detection
   4. Drum revolution trouble detection
   5. Drum phase trouble detection
   6. Capstan trouble (NO CFG pulse) detection
   7. Capstan trouble (CFG pulse frequency is too high) detection

[Service Mode 6]

1) "Battery down adjustment" can be made. Battery level is shown by the two digits on the left side of LCD.
2) Video system adjustment is performed in the mode when otherwise specified.

[Service Mode 7]

This is not used for this type.

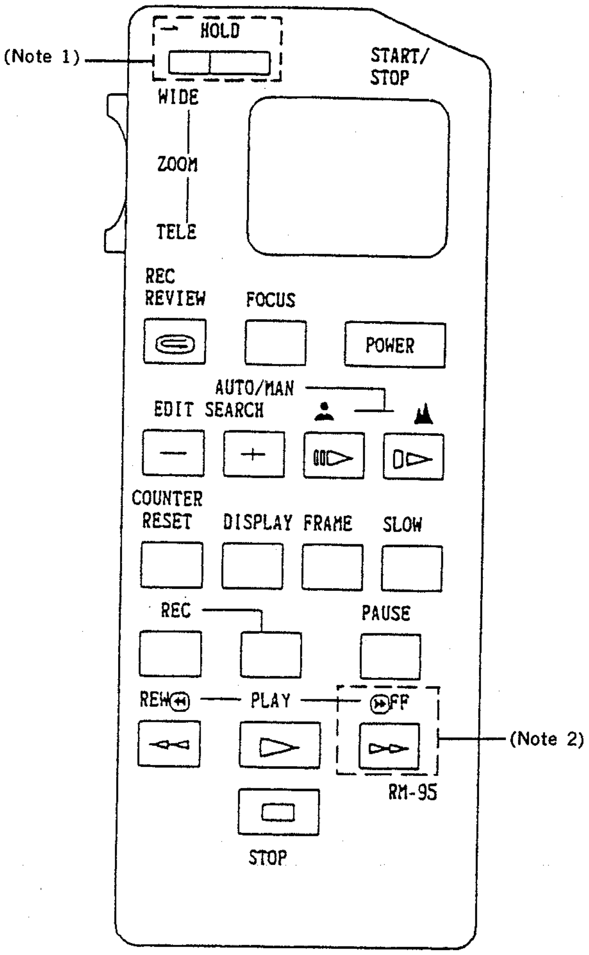
Service Mode by LINCS Commander

1. How to Set Service Mode

The service mode consists of two modes: ADJUST MODE which adjusts EVR and STATUS INFORMATION MODE (hereinafter called STATUS MODE) which indicates the setting status (This model: STATUS MODE only.)
The mode can be changed to STATUS MODE by connecting the service mode commander (HOLD KEY is kept on the service side).

Cf1 Service mode can be discontinued by power OFF or by advancing STATUS No., which returns to the normal mode (Service mode condition).

RM-95 (Partially modified product)



(Note 1)
HOLD
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PLAY
FF
(Note 2)
RM-95
STOP

(Note 1)
Hold ON/OFF key for ordinary users serves as the NORMAL/SERVICE selector key for the service man.
(Note 2)
This key is used for advancing the FF NO. NEXT. STATUS NO.

Service Mode Display by LINCS Commander
STATUS MODE consists of the following modes;

MODE		Command display	Set display	Remarks
STATUS INFORMATION	Battery voltage	[Counter] −1 : XX : XX ⇧ ⇧ on/off Battery voltage [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	Battery voltage is the value obtained by dividing by resistance. (Refer to the next page)
	Last memo emergency	[Counter] −2 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	The emergency occurred last while using the set should be stored (memorized) even when the power is turned off (battery OFF). This is called LAST MEMO EMERGENCY. This machine, is provided with 6 types of LAST EMERGENCIES (Refer to the next page).
	Present emergency	[Counter] −3 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off Same as NORMAL	⇦ Same as left	

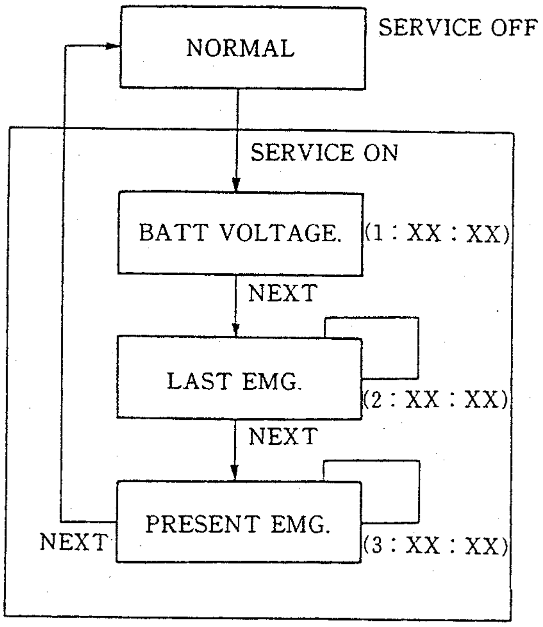
[LINCS Command]

WORD 0 B0 B7	WORD 1 B0 B7	Command name	
1 1 1 1 1 1 1 1 (Note 1)	0 0 0 1 1 1 0 0 (Note 2)	NEXT	Switches display

Note 1 : ON/OFF of service mode is decided depending on WORD 0, and therefore the service remote control continuously sends 1 1 1 1 1 1 1 1 B to WORD 0 even when commands are not sent.

Note 2 : NEXT WORD is common to the ordinary FF command.

(Service Mode (Status Display) Condition Transition Diagram) by LINCS Commander

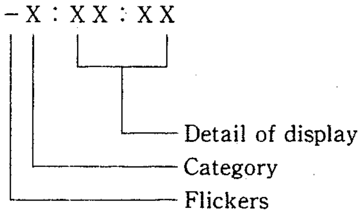

NORMAL
SERVICE OFF
SERVICE ON
BATT VOLTAGE.
(1 : XX : XX)
NEXT
LAST EMG.
(2 : XX : XX)
NEXT
PRESENT EMG.
(3 : XX : XX)
NEXT

* To turn off the service mode (NORMAL) ;

1. Actuate the POWER OFF slide switch.
2. Advance STATUS NO until NORMAL is returned.

Note : When all the required operations are completed, return the service mode to NORMAL.

[Display Method]


-X : XX : XX
Detail of display
Category
Flickers

Category	Detail of display
1	Result of battery voltage A/D conversion (sexadecimal indication). Same indications used when adjusting P. C. board)
2	LAST EMG. (Refer to the table below) (Note 1)
3	PRESENT EMG. (Refer to the table below) (Note 2)

Note 1 : LAST EMG. is not updated even when a trouble occurs during the service mode. Therefore, the LAST EMG. immediately before starting the service mode is stored.

[Displaying Trouble in Service Mode by LINCS Commander]

Condition of trouble	PRESENT EMG. display	LAST EMG.
No trouble	00 : 00	00 : 00
Loading/unloading trouble	00 : 01	00 : 01
No CAP FG	00 : 02	00 : 02
Trouble with CAP high speed revolution	00 : 03	00 : 03
Trouble with REEL revolution	00 : 04	00 : 04
Trouble with drum revolution (0)	00 : 05	00 : 05
Trouble with drum phase (0)	00 : 06	00 : 06

* Indicates the code which is exactly the same as the warning code in the service mode.

3-1. POWER SUPPLY CHECK

3-1-1. VA5V Voltage Check (VA-43 board)

Mode	Camera Standby
Signal	Arbitrary
Measurement point	W361 pin ②
Measuring equipment	Digital voltmeter
Specified value	5.05±0.05Vdc

[Check Procedure]

1) The voltage of W361 pin ② must meet the specified value.

3-2. SYSTEM CONTROL ADJUSTMENT

3-2-1. Battery Down Adjustment (SS-93P board)

Mode	Camera REC
Subject	Arbitrary
Measurement point	+ : BATT (+) terminal − : BATT (−) terminal
Measuring equipment	Digital voltmeter
Adjustment element	RV001
Specified value	When power voltage is 5.76±0.01Vdc and LCD displays the counter, digits of "92" are indicated.

Note 1 : A thick short lead wire should be used to connect between the stabilized power supply and the battery terminals BATT (+) and' BATT (−) of this machine.

Note 2 : Connect the camera unit and EVF unit and adjust them.

[Adjustment Procedure]

1) Set the unit is Service Mode 6 (Refer to Service Mode).
2) Make sure that the power voltage is 6.5±0.1Vdc.
3) Set the machine in the Camera REC mode.
4) Slowly lower the power voltage down to 5.76 ±0.01Vdc.
5) By operating RV001, adjust the two digits on the left side of counter of LCD to "92".

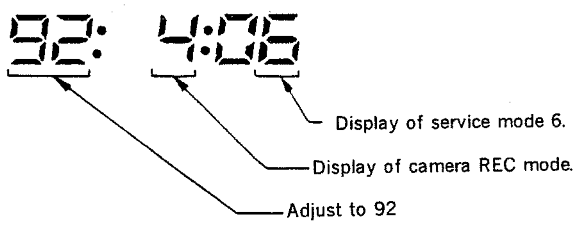


Fig. 3-5.

[Check Procedure]

1) Make sure that the machine is set in Service Mode 6.
2) Set the power voltage to 6.5±0.1Vdc.
3) Switch the power supply from OFF to ON.
4) Switch to CAMERA REC mode.
5) Slowly lower the power voltage down to 5.81±0.01Vdc.
6) Make sure that the battery down warning displayed on LCD is one of the following two ;
   1) 🔋 mark is not displayed.
   2) 🔋 mark is slowly flickering (0.8Hz).
7) Slowly lower the power voltage down to 5.71±0.01Vdc. Make sure 🔋 mark displayed on LCD is quickly flickering.
8) Release the service mode (Refer to [Service Mode]).

3-2-2. Clock Accuracy Check (FC-25P board)

Mode	E-E
Measurement point	IC101 pin ㊾
Measuring equipment	Frequency counter
Adjustment element	CT101
Specified value	2048.005±0.008Hz

[Adjustment Procedure]

1) Adjust to 2048.005+0.008Hz with CT101.

3-3. SERVO SYSTEM ADJUSTMENT

3-3-1. Switching Position Adjustment (SS-93P board)

Mode	Playback
Signal	For alignment tape tracking adjustment (WR5-1C)
Measurement point	CH1 : CN004 pin ④ (RF OUT) CH2 : IC001 pin ⑭ (RF SWP)
Measuring equipment	Oscilloscope
Adjustment element	RV002
Specified value	0±10μsec

Note : Connect pins ② and ⑧ of CN004 to GND.

[Adjustment Procedure]

1) Adjust RV002 until the marker of RF CH2 waveform coincides with the lowering part of RF SWP waveform.

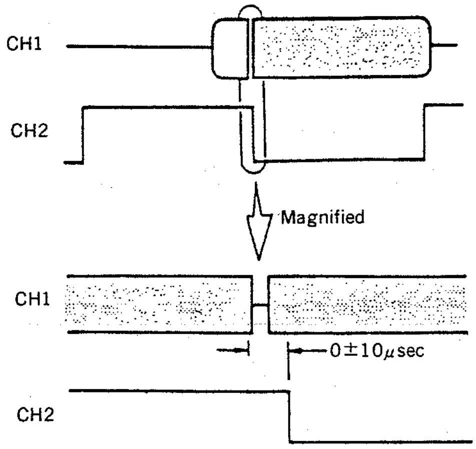


Fig. 3-6.

3-4. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle be followed the undermentioned adjustment procedure.

The color video signal supplied from the pattern generator is utilized as the video input signal for the video system adjustment in recording mode. Make sure that the SYNC signal and color burst signal are matched with those the set-up of during the adjustment of as shown in Fig. 3-2.

[Adjustment Procedure]

1) Playback frequency response adjustment
2) Flying erase check
3) Y/C separation adjustment
4) IR2 adjustment
5) Emphasis input level adjustment
6) Video out level adjustment
7) PB Y level adjustment
8) Y FM carrier frequency adjustment
9) Y FM deviation adjustment
10) Chroma emphasis f_0 adjustment
11) AFM TRAP adjustment
12) PB Y De-emphasis level adjustment
13) Feed back chroma adjustment
14) Chroma DL gain adjustment
15) HUE phase deviation adjustment (use a vectorscope)
16) HUE phase deviation adjustment (use an oscilloscope)
17) REC Y recording current adjustment
18) REC C recording current adjustment
19) REC ATE recording current check
20) REC AFM recording current check
21) EVF display position adjustment
22) ATF error offset adjustment

3-4-1. Playback Frequency Response Adjustment (SS-93P board)

(1) CH1 and CH2 adjustment

CH2 adjustment is shown in [ ] .

Mode	Playback
Signal	Alignment tape for frequency response adjustment (WR5-6C)
Measurement point	Pin ④ of CN004 SS-93P board External trigger : Pin ② of CN004 in SS-93P board Trigger slope : +, [−]
Measuring instrument	Oscilloscope
Adjusting element	RV302 [RV301]
Specified value	3.58MHz level : 5.5MHz level=4 : 3

[Adjustment method]

1) Adjustment RV302 [RV301] so that the level difference ratio 3.58MHz and 5.5MHz should be 4 : 3.

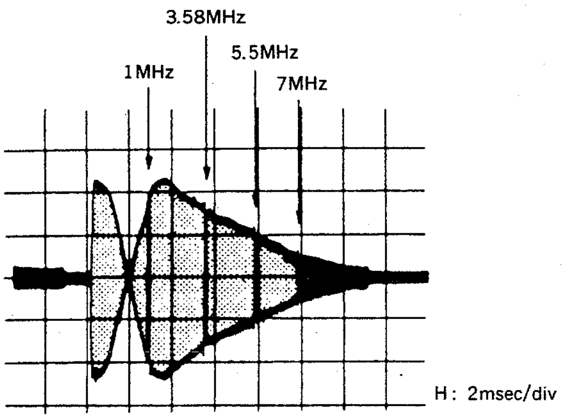


Fig. 3-7.

(2) CH1' adjustment

Mode	Playback Service mode 4*¹
Signal	Alignment tape for frequency response adjustment (WR5-2C)
Measurement point	Pin ⑤ of CN004 in SS-93P board External trigger : Pin ② of CN004 in SS-93P board Trigger slope : −
Measuring instrument	Oscilloscope
Adjustment element	RV306
Specified value	3.58MHz level : 5.5MHz level=4 : 3.3

* 1 : Make the unit to service mode 4 with reference to [Service mode] and mape sure to release it after the adjustment.

[Adjustment method]

1) Adjust RV306 so that the level difference ratio between 3.58MHz and 5.5MHz should be 4 : 3.3.

3-4-2. Flying Erase Check (SS-93P board)

Mode	Record
Signal	Arbitrary
Measurement point	Pin ⑫ of CN003 (FE (X))
Measuring instrument	Oscilloscope and frequency counter
Specified value	Frequency : more than 7.5MHz Voltage : more than 7.0Vp-p

Note : Be sure to use MP type tape.

[Checking method]

1) Confirm that the oscillation frequency is more than 7.5MHz, and the oscillation volltage is more than 7.0Vp-p.

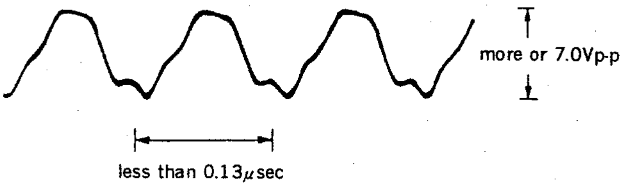


Fig. 3-8.

3-4-3. Y/C Separation Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin ㉕
Measuring instrument	Oscilloscope
Adjusting element	RV361
Specified value	Minimum residual chroma component

Note : Before adjustment, connect 10μF capacitor in between IC360 pin ㊴ and ground.

[Adjustment method]

1) Adjust RV361 to minimize residual chroma component.

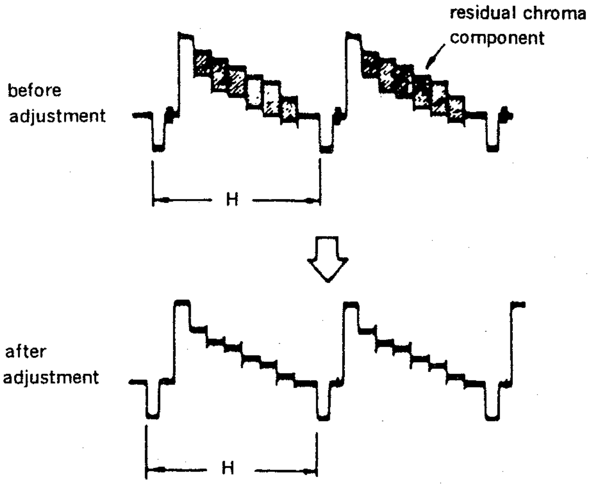


Fig. 3-9.

3-4-4. IR2 Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin ⑧
Measuring instrument	Oscilloscope
Adjusting element	RV362
Specified value	6.9±0.2μsec

Note : Adjust after connecting a 10kΩ resistor between pin ⑧ and GND of IC360.

[Adjustment method]

1) Adjust RV362 for 6.9±0.2μsec.

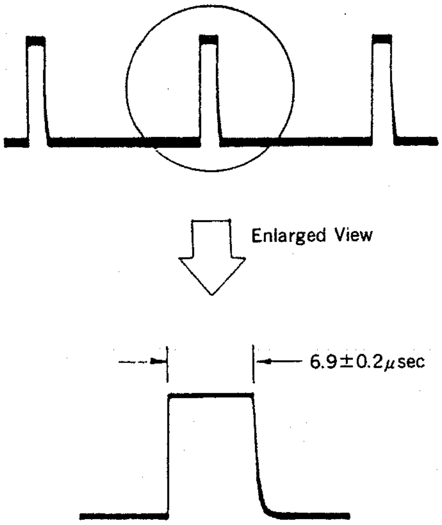


Fig. 3-10.

3-4-5. Emphasis Input Level Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin (54)
Measuring instrument	Oscilloscope
Adjusting element	RV363
Specified value	0.50±0.02Vp-p

[Adjustment method]

1) Adjust RV363 for 0.50±0.02Vp-p.

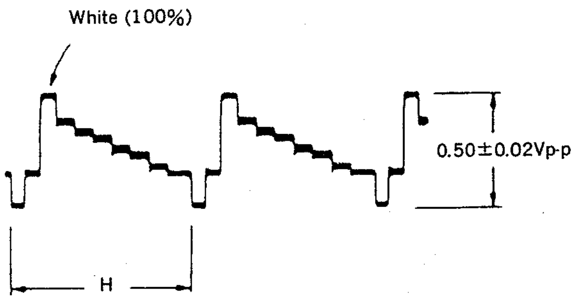


Fig. 3-11.

3-4-6. Video Out Level Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV373
Specified value	1.00±0.04Vp-p

Note : Be sure to terminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Adjust RV373 on for 1.00±0.04Vp-p.

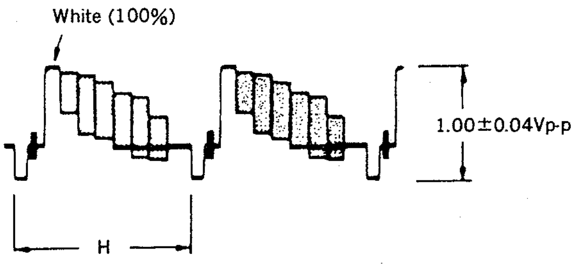


Fig. 3-12.

3-4-7. PB Y Level Adjustment (VA-43 board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP), Color bar portion
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV362
Specified value	1.00±0.04Vp-p

Note 1 : Be sure to be off (SP) the EDIT (SP/LP) switch (PA-24P board S990).

Note 2 : Be sure to teminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Adjust RV362 for 1.00±0.04Vp-p.

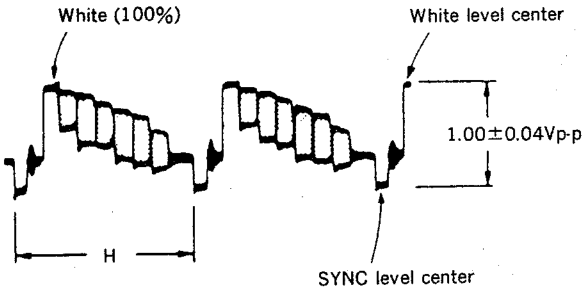


Fig. 3-13.

3-4-8. Y FM Carrier Frequency Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	No signal
Measurement point	IC360 Pin ㊾
Measuring instrument	Frequency counter
Adjusting element	RV365
Specified value	4.20±0.04MHz

[Adjustment method]

1) Adjust RV365 for 4.20±0.04MHz
2) Perform "Y FM Deviation Adjustment".

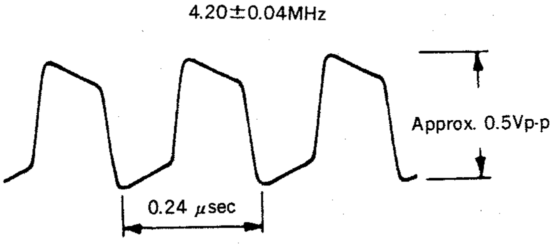


Fig. 3-14.

3-4-9. Y FM Deviation Adjustment (VA-43 board)

Mode	Record and Playback (Service mode 6)
Signal	Color bar
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV364
Specified value	Playback level: 1.00±0.05Vp-p

Note 1 : Be sure that the "VIDEO OUT Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been already completed.

Note 2 : Be sure to be off (SP) the EDIT (SP/LP) switch (S990 on PA-24P board)

Note 3 : Be sure to terminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Record the color bar signal.
2) Playback the section recorded by 1.)
3) Confirm that the playback output level is 1.00±0.05 Vp-p.
4) When 3) is not satisfide, adjust RV364 as follows. And then repeat the abovementioned steps 1) to 3).

	RV364 turning direction
more than the specified value	counter-clockwise (↺)
less than the specified value	clockwise (↻)

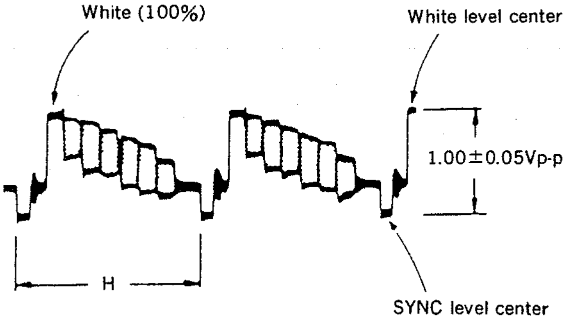


Fig. 3-15.

3-4-10. Chroma Emphasis fo Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 Pin ⑤
Measuring instrument	Oscilloscope
Measurement element	FL362
Specified value	fo component minimum.

[Adjustment method]

1) Adjust FL362 to minimize the amplitude of flat components of chroma signal.

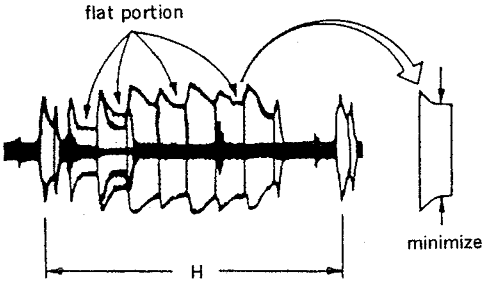

flat portion
minimize
H

Fig. 3-16.

3-4-11. AFM TRAP Adjustment (VA-43 board)

Mode	Camera Record (Service mode 6)
Signal	Color bar
Measurement point	Fig. 3-17
Measuring instrument	Oscilloscope
Adjusting element	CV361
Specified value	Minimize the amplitude

[Connection]

1) Connect 1μF capacitor and 1kΩ resistor in series between Q581 Emitter and L383, and also connect a probe to the measuring point Ⓐ.

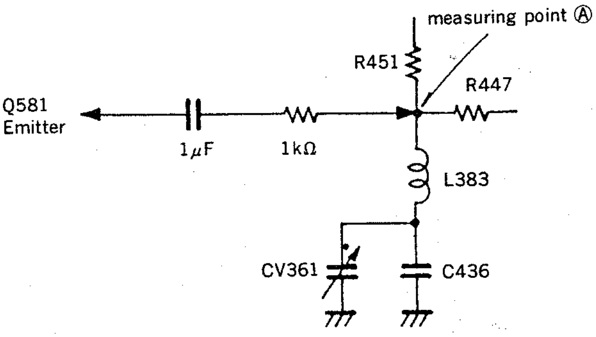

measuring point Ⓐ
R451
R447
Q581 Emitter
1μF
1kΩ
L383
CV361
C436

Fig. 3-17.

[Adjustment method]

1) Adjust with CV361 so as to minimize the amplitude.

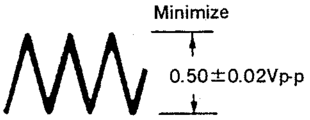

Minimize
0.50±0.02Vp-p

Fig. 3-18.

2) Remove 1μF capahitor and 1kΩ resistor.

3-4-12. PB Y De-Emphasis Level Adjustment (VA-43 board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-4CSP), Color bar portion
Measurement point	IC360 Pin ㊼
Measuring instrument	Oscilloscope
Adjusting element	RV366
Specified value	0.50±0.02Vp-p

[Adjustment method]

1) Adjust RV366 for 0.50±0.02Vp-p.

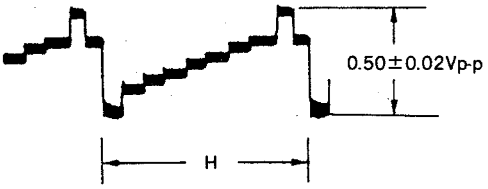

0.50±0.02Vp-p
H

Fig. 3-19.

3-4-13. Feed Back Chroma Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	Emitter of Q374
Measuring instrument	Oscilloscope
Adjusting element	RV372
Specified value	Minimize the correlative chroma component

[Adjustment method]

1) Adjust with RV372 so as to minimize the chroma component.

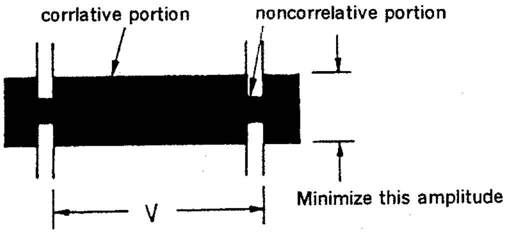

corrlative portion
noncorrelative portion
V
Minimize this amplitude

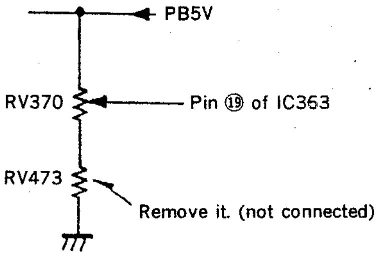
Fig. 3-20.

3-4-14. Chroma DL Gain Adjustment (VA-43 board)

There are some sets RV370 is not mounted.

In case of RV370 mounted set, remove R473 15kΩ mounted between RV370 and GND.

Note : To make pin ⑲ of IC363 to 5V adjusts to the inner setting value.


PB5V
RV370
Pin ⑲ of IC363
RV473
Remove it. (not connected)

3-4-15. HUE Phase Deviation Adjustment (VA-43 board) (Use a Vectorscope)

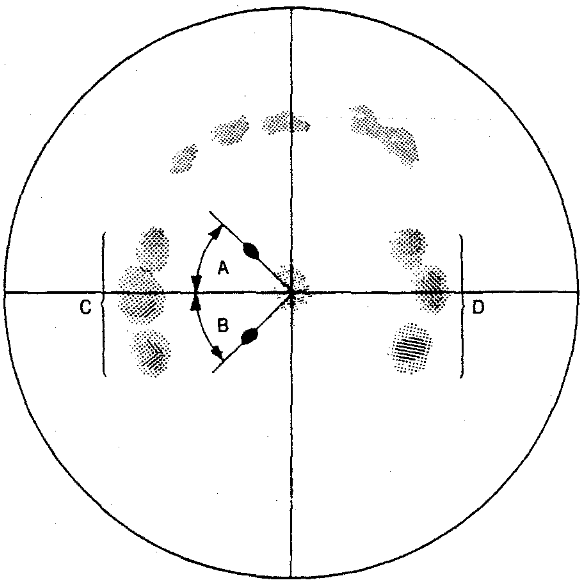
Mode	Playback+still
Signal	Alignment tape for operation check (WR5-4CL), Color bar portion
Measurement point	J361 (VIDEO OUT)
Measuring instrument	Vectorscope
Adjusting element	RV369 (FSC), RV368 (APC LPF)
Specified value	See Fig 3-22

[Connection]

1) Input 4.43MHz signal from Pin ⑯ of IC360 to 1CH of an oscilloscope.
2) Connect 1CH output of an oscilloscope to the auxiliary reference input of a vectorscope.
3) Put on the axiliary subcarrier switch of a vectorscope.

[Adjustment method]

1) Adjust with RV369 so as to equalize A and B as shown in Fig. 3-22.
2) Adjust with RV368 so as to minimize the shaking of each three brighting point of C and D.



RV369 : A=B
RV368 : make C and D a contrast

Fig. 3-22.

3-4-16. HUE Phase Deviation Adjustment (VA-43 board) (Use an Oscilloscope)

Mode	Playback+Still
Signal	Signal
Measurement point	Monitor TV
Measuring instrument	Monitor TV
Adjusting element	RV369 (FSC), RV368 (APC LPF)
Specified value	Minimize the HUE phase deviation on the monitor screen

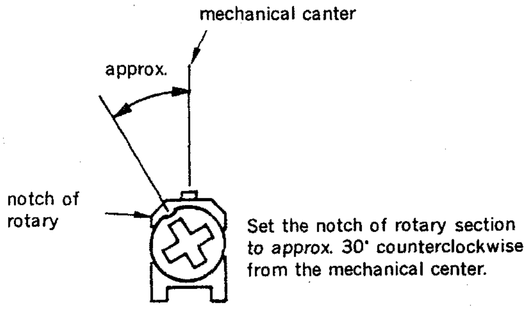

mechanical canter
approx.
notch of rotary
Set the notch of rotary section to approx. 30° counterclockwise from the mechanical center.

Fig. 3-23.

[Adjustment method]

1) Set RV369 as shown in Fig. 3-23.
2) Adjust with RV368 so as to minimize the HUE phase deviation on the monitor screen.

3-4-17. REC Y Recording Current Adjustment (VA-43 board)

Mode	Record (Service mode 6)
Signal	No signal
Measurement point	CN004 Pin ③ (REC RF) on SS-93P board
Measuring instrument	Oscilloscope
Adjusting element	RV367
Specified value	210±10mVp-p

Note : Be sure to perform Recording Current Adjustment of REC C after the REC Y Recording Current Adjustment.

[Adjustment method]

1) Adjust RV367 for 210±10mVp-p.

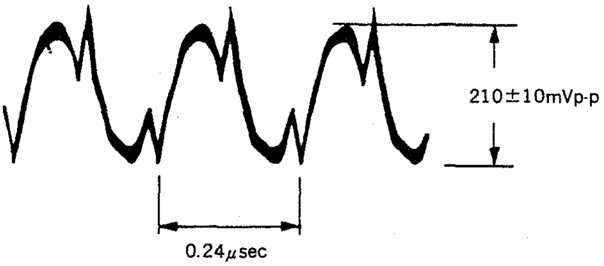


Fig. 3-24.

3-4-18. REC C Recording Current Adjustment (VA-43 board)

Mode	Record (Service mode 6)
Signal	Color bar
Measurement point	W360 Pin ④ (REC C RF)
Measuring instrument	Oscilloscope
Adjusting element	RV374
Specified value	110mVp-p

Note : Use MP type tape.

[Adjustment method]

1) Adjust RV374 for 110mVp-p.

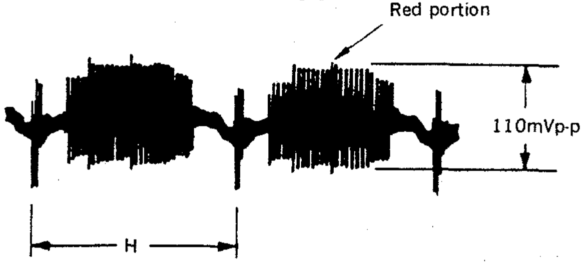


Fig. 3-25.

3-4-19. REC ATF Recording Current Check (VA-43 board)

Mode	Record (Service mode 6)
Measurement point	W360 Pin ③ (REC ATF RF)
Adjusting instrument	Oscilloscope
Specified value	approx. 370mVp-p

[Checking method]

1) Confirm that the level on W360 Pin ③ because approx. 370mVp-p.

3-4-20. REC AFM Recording Current Check (VA-43 board)

Mode	Record (Service mode 6)
Measurement point	W360 Pin ⑤ (REC AFM RF)
Measuring instrument	Oscilloscope
Specified value	150mVp-p

[Checking method]

1) Confirm the level on W360 Pin ⑤ becomes 150mVp-p.

3-4-21. EVF Display position Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Object	Optional
Adjustment element	CV360
Specified value	Position the "X" mark in the center of the monitor screen

[Adjustment method]

1) Adjust CV360 to position the "X" mark at the center of the monitor sereen (a=b). (See Fig. 3-26.)

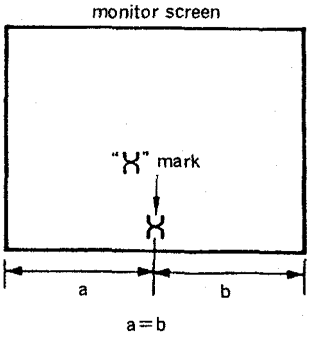


Fig. 3-26.

3-4-22. ATF Error Offset Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC250 pin ⑫
Measuring instrument	Digital voltmeter
Adjusting element	RV250
Specified value	2.50±0.05Vdc

[Connection]

1) Before adjusting, connect an 220μF capacitor ot PB RF OUT as shown in Fig. 3-25.

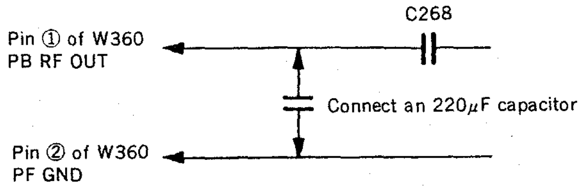

C268
Pin ① of W360
PB RF OUT
Connect an 220μF capacitor
Pin ② of W360
PF GND

Fig. 3-27.

[Adjustment method]

1) Adjust RV250 for 2.50±0.05Vdc.
2) After adjustment, remove the capacitor.

3-5. AUDIO SYSTEM ADJUSTMENT

Make adjustment by inputting the color bar signal to VIDEO IN terminal.

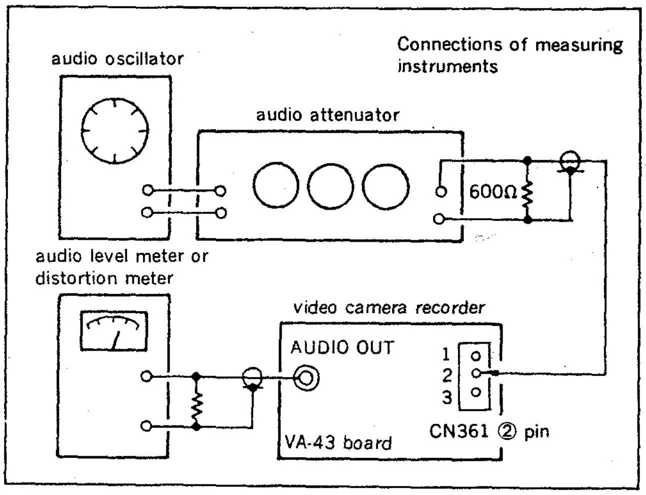

Connections of measuring instruments
audio oscillator
audio attenuator
600Ω
audio level meter or distortion meter
video camera recorder
AUDIO OUT
1
2
3
VA-43 board
CN361 ② pin

Fig. 3-28.

3-5-1. E-E Output Level Check

Mode	Record
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±2dBs

[Check Procedure]

1) Audio output level must be −7.5±2dBs.

3-5-2. Overall Level Characteristics Check

Mode	Self recording and playback
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±3dBs

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Audio output level should be −7.5±3dBs.

3-5-3. Overall Distortion Factor Check

Mode	Self recording and playback
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Distortion meter
Specified value	0.5% or less *1

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Distortion factor should be 0.5% or less.

*1 This is the value when the distortion factor measuring filter (Fig. 3-29) is used. It should be 1.0% or less, if the filter is not used.

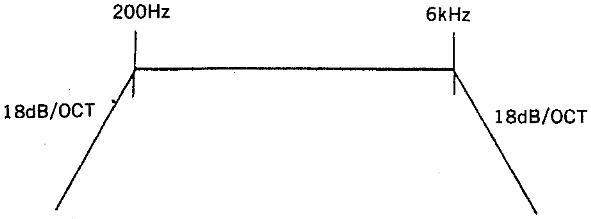


Fig. 3-29.

3-5-4. Overall Noise Level Check

Mode	Self recording and playback
Signal	No signal Connect the load resistor, 600Ω, between CN361 ② terminal and GND
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−66dBs or less *2

[Check Procedure]

1) Recored the signal.
2) Playback the recorded portion.
3) Noise level should be −66dBs or less *2.

*2 This is the value when IHF-A auditory sense correction filter is used.

3-6. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

3-6-1. Horizontality/Inclination Adjustment

Mode	Playback
Signal	alignment tape for operation checking (WR5-5CSP) monoscope portion
Specified value	Refer to Fig. 3-31

[Adjustment Procedure]

1) Adjust Volume Array D (Bright) in such a way that the brightness of CRT becomes suitable to be seen (Refer to Fig. 3-32).
2) Loosen the DY (Deflection Yoke) clamping nut (Refer to Fig. 3-30).
3) Set the picture on the horizontal level by turning DY.
4) Tighten the DY clamping nut (Do not tighten excessively).

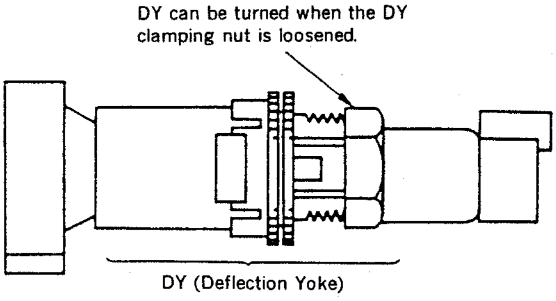
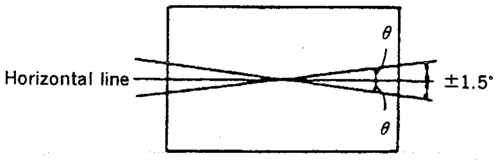
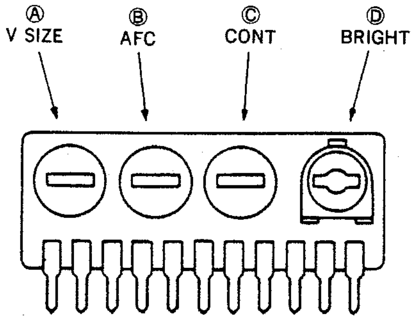


Fig. 3-30.



specified value: Make sure that the picture is kept within ±1.5° of horizontal line.

Fig. 3-31.



Volume array (CP901)

Fig. 3-32.

3-6-2. Centering Adjustment

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-5CSP)
Specified value	Refer to Fig. 3-34

[Adjustment Procedure]

1) By operating the centering magnet, adjust the position of picture until the upper, lower, left and right sides of picture are kept uniform.

Note: The centering position is changed by the effect of earth magnetism.
Turn the magnet 360° in horizontal direction and adjust at the center of displacement.

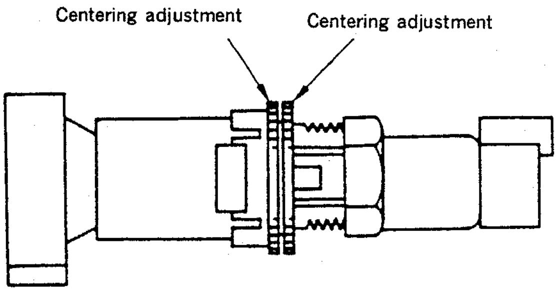


Fig. 3-33.

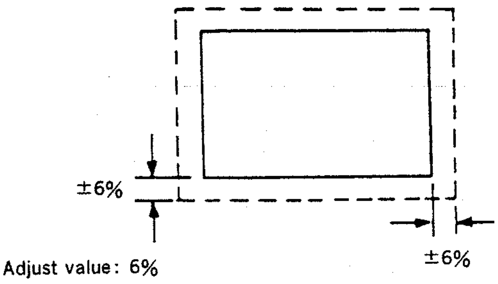


Fig. 3-34.

3-6-3. AFC Adjustment (VF-13P board)

Mode	Chart standard puiture frame camera stand-by
Signal	Color bar
Measurement point	C915 ⊕ side
Measuring equipment	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ
Specified value	2.6±0.1Vdc

[Adjustment Procedure]

1) Adjust volume array Ⓑ until 2.6±0.1Vdc is obtained (Refer to Fig. 3-32).

3-6-4. Horizontal Amplitude Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-5CSP)
Adjustment element	C905
Specified value	6±3%

[Adjustment Procedure]

1) Set the focus with RV901.
2) By turning volume array Ⓐ, fit the upper part and lower part of monoscope picture to the respective upper and lower edges of screen.
(Refer to Fig. 3-35).
3) Turn the volume array until the normal level of brightness is obtained.
4) Shortcircuit or open the pattern (A) of H size adjust capacitor (C905) so that the overscan in horizontal direction becomes 6±3% (Left−right total). (Refer to Fig. 3-36).

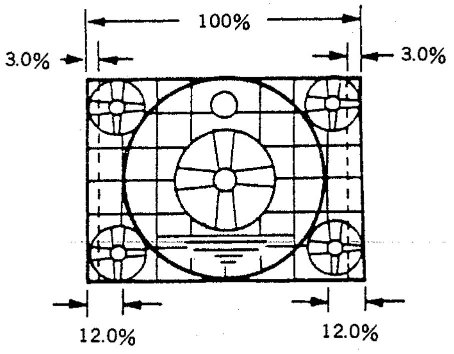
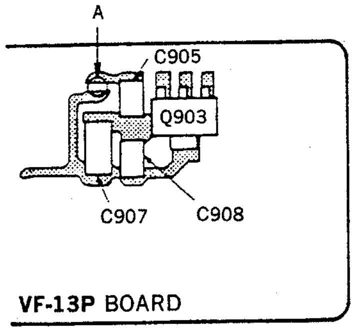


Fig. 3-35.



A	H size
Open	small ↕
Short	Large

Fig. 3-36.

3-6-5. Vertical Amplitude Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	Volume array Ⓐ
Specified value	6±3%

[Adjustment Procedure]

1) With volume array Ⓐ, set the vertical overscan to 6± 3% (upper/lower total).

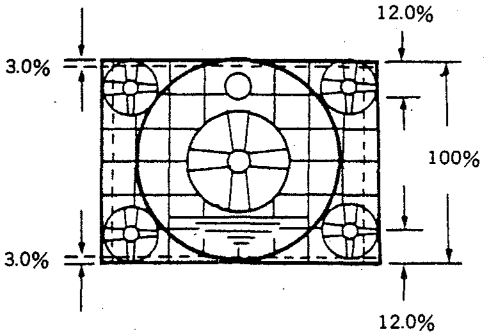


Fig. 3-38.

3-6-6. Brightness/Contrast Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	Brightness : Volume array Ⓓ Contrast : Volume array Ⓒ

[Adjustment Procedure]

1) Alternately adjust volume arrays, Ⓓ and Ⓒ until the contrast of gray scale is properly displayed.
   (The bright portion should not be so bright as the contrast of gray scale is clearly shown. The dark portion should not be so dark as the difference between the first section (darkest place) and the 3rd section of gray scale is not clearly identified).

3-6-7. Focus Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	RV901

[Adjustment Procedure]

1) Adjust to the best focus point with RV901.

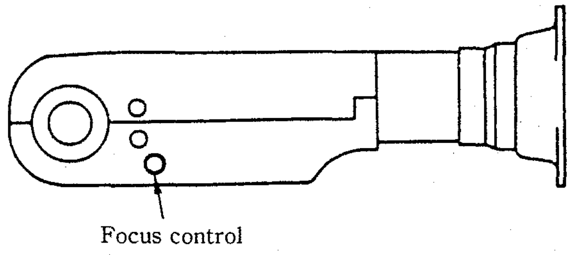


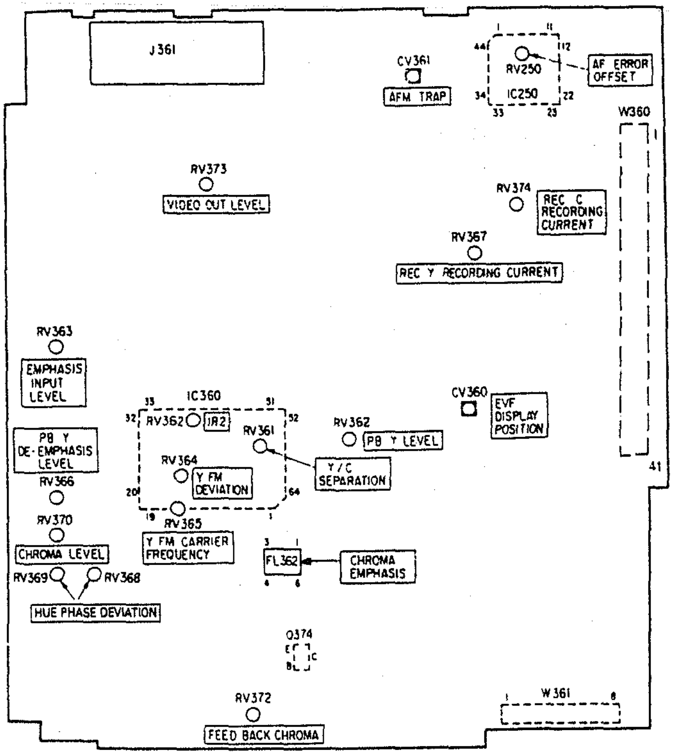
Fig. 3-39.

3-6-8. Horizontal Amplitude and Vertical Amplitude check

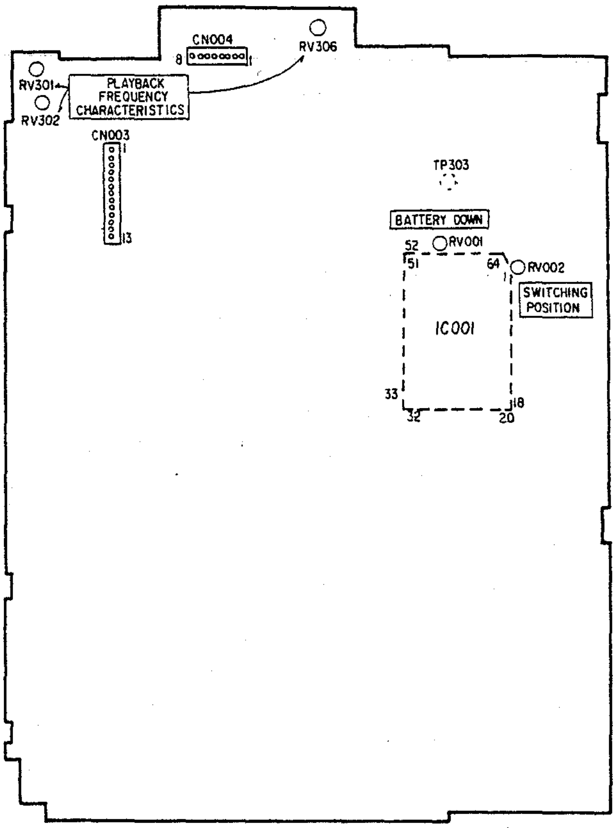
Make sure that 3-6-4. Horizontal Amplitude Adjustment and 3-6-5. Vertical Amplitude Adjustment are within the specified range. When the specified value is not met, make readjustments. In such a case, 3-6-6. Brightness/Contrast Adjustment and 3-6-7. Focus Adjustment should also be made at the same time.

3-7. ADJUSTING PARTS LOCATION DIAGRAM

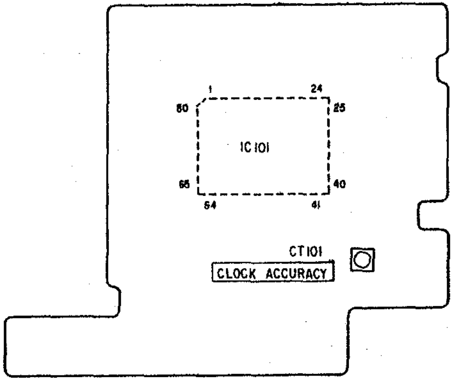
VA-43 BOARD (COMPONENT SIDE)


J361
CV361
AFM TRAP
RV250
IC250
AF ERROR OFFSET
W360
RV373
VIDEO OUT LEVEL
RV374
REC C RECORDING CURRENT
RV367
REC Y RECORDING CURRENT
RV363
EMPHASIS INPUT LEVEL
PB Y DE-EMPHASIS LEVEL
RV366
RV370
CHROMA LEVEL
RV369
RV368
HUE PHASE DEVIATION
IC360
RV362
JR2
RV361
RV364
Y FM DEVIATION
RV365
Y FM CARRIER FREQUENCY
CV360
EVF DISPLAY POSITION
RV362
PB Y LEVEL
Y/C SEPARATION
FL362
CHROMA EMPHASIS
Q374
RV372
FEED BACK CHROMA
W361

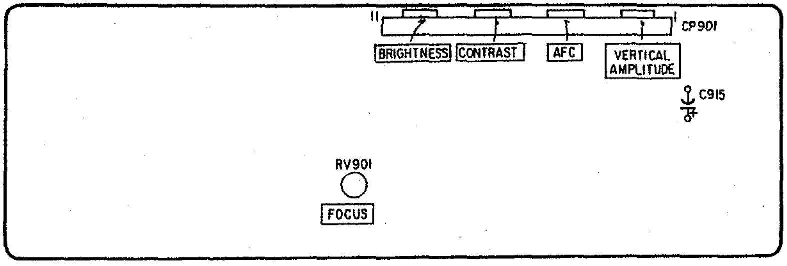
SS-93P BOARD (CONDUCTOR SIDE)


CN004
RV306
RV301
RV302
PLAYBACK FREQUENCY CHARACTERISTICS
CN003
TP303
BATTERY DOWN
RV001
RV002
SWITCHING POSITION
IC001

FC-25P BOARD (COMPONENT SIDE)


IC101
CT101
CLOCK ACCURACY

VF-13P BOARD (COMPONENT SIDE)


CP901
BRIGHTNESS
CONTRAST
AFC
VERTICAL AMPLITUDE
C915
RV901
FOCUS